KEMI
Kemikalieinspektionen

The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2019

ENFORCEMENT 11/20

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The Swedish Chemicals Agency is supervisory authority under the Government. We work in Sweden, the EU and internationally to develop legislation and other incentives to promote good health and an improved environment. We monitor compliance of applicable rules on chemical products, pesticides and substances in articles and carry out inspections. We also provide inspection guidance for municipalities and county councils. We review and authorise pesticides before they can be used. Our environmental quality objective is A Non-toxic Environment.

Article number: 511 370

Preface

The Swedish Chemicals Agency is the central enforcement authority for regulations within the field of chemicals. One aspect of the Agency's supervisory activities consists of conducting chemical analyses of products in order to check that they do not contain hazardous chemical substances to which legal restrictions apply. This report is a synthesis of the analyses conducted by the Swedish Chemicals Agency's Enforcement and Statistics Department over the course of 2019. The report does not encompass those analyses that other parts of the Agency have requested. The synthesis has been performed by Frida Ramström at the Unit for Enforcement of Rules – Pesticides and Articles.

Contents

Glossary

Abbreviation	Explanation
ICSMS	Information and Communication System on Market Surveillance – a system in which supervisory authorities in the EU report controlled products.
PVC	Poly Vinyl Chloride – a kind of plastic that can be made soft by the addition of plasticisers.
Safety Gate	Safety Gate has previously been called Rapid Alert and Rapex. It stands for ”Rapid Alert System for non-food dangerous products” and is a system in which supervisory authorities in the EU report dangerous products.
XRF	X-Ray Fluorescence – an analysis method for screening analyses of elements on the surface of material.

Summary

The Swedish Chemical Agency´s Enforcement and Statistics Department makes inspections of companies manufacturing, importing, and providing chemical products and articles that have been treated with or contain chemical substances. One part of the inspection activity is chemical analyses of products to check that they fulfil the requirements of the chemical legislation. This report is an account of analyses made by the Enforcement Department during 2019.

The products that have been analysed are within the categories *toys and childcare articles, clothing, shoes and accessories, electrical products, building materials and furnishings, sports and leisure equipment* and *chemical products.* In total, 911 products have been tested during 2019 and 18 per cent of these contained forbidden substances in levels above the limit values in the legislation. This proportion is at the same level as previous years.

The category with the highest proportion of forbidden substances was *electrical products*. In the category c*hemical products,* none of the products contained forbidden substances.

In this report, we have compiled information on what substances on the Candidate List that we find in the products and in what type of products they are found. The substance that we find most often is the softener bis(2-etylhexyl) phthalate (DEHP) that can be found in different products made of soft PVC plastic. We have also compiled information on what products we have found cadmium in.

We informed the companies that had sold the products containing forbidden substances, and in most cases they made a voluntary withdrawal from the market. In the cases when they did not do this, we placed a sales ban. We share the results from the analyses with other countries' enforcement authorities and the public also receive some information. In this way, companies and other authorities may use the results and focus their effort on the products with the highest risk of containing hazardous and forbidden substances.

During 2019, we have prioritised analyses of consumer products within the lower price range and articles made of risk materials. We will continue to prioritise enforcement of these types of products and focus on the products that we estimate have the highest risk of containing dangerous substances. Chemical analysis of articles and chemical products is an important part of this work. We will continue to publish the results in separate reports for single projects and in annual compilations like this one.

Sammanfattning

Kemikalieinspektionens tillsynsavdelning inspekterar företag som tillverkar, importerar och säljer kemiska produkter och varor som innehåller eller har behandlats med kemiska ämnen. Som en del av kontrollen utförs kemiska analyser av produkter för att kontrollera att produkterna klarar de krav som finns i lagstiftningen. Denna rapport är en sammanställning av de analyser som tillsynsavdelningen har gjort under 2019.

De produkter som Kemikalieinspektionen har analyserat sorterar under kategorierna *leksaker och barnavårdsartiklar, kläder, skor och accessoarer, elektriska produkter, byggvaror och inredning, sport- och fritidsvaror* samt *kemiska produkter.* Totalt har 911 produkter analyserats under 2019 och 18 procent av dessa innehöll ämnen i halter över gränsvärden i lagstiftningen. Det är ungefär samma nivå som tidigare år.

Den varugrupp som hade störst andel varor med otillåtna ämnen i var *elektriska produkter*. I kategorin *kemiska produkter* var det inga produkter som innehöll otillåtna ämnen.

I rapporten har vi sammanställt vilka ämnen på kandidatförteckningen vi hittar vid analyserna och i vilka varor de finns. Det ämnet vi hittar mest av är mjukgöraren di(2-etylhexyl)ftalat (DEHP) som finns i olika sorters varor gjorda av mjuk PVC-plast. Vi har även gjort en sammanställning av i vilka varor vi hittar kadmium.

Vi informerade företagen som hade sålt de varor som vi hittade förbjudna ämnen i och i de flesta fall valde de att frivilligt dra tillbaka varorna från marknaden. I de fall de inte gjorde det tog vi beslut om försäljningsförbud. Analysresultaten delas med andra länders tillsynsmyndigheter och allmänheten får också ta del av viss information. På så sätt kan företag och andra myndigheter dra nytta av resultaten och själva rikta insatser mot de varor där det finns stor risk att hitta skadliga och förbjudna ämnen.

Under 2019 har vi prioriterat analyser av konsumentvaror inom lågprissegmentet samt varor av vissa riskmaterial. Vi kommer även fortsättningsvis att prioritera tillsyn av denna typ av varor och fokusera på de varor som vi bedömer har störst risk för innehåll av farliga ämnen. Att göra analyser av varor och kemiska produkter är en viktig del av vårt arbete. Vi kommer fortsätta att publicera resultaten i enskilda rapporter för enskilda projekt samt i årssammanställningar som denna.

1 Introduction

1.1 Background

As one part of the enforcement activities during 2019, the Swedish Chemicals Agency has checked the content of chemical substances in articles and chemical products using chemical analyses. These chemical analyses have been conducted partly by using the Agency's own XRF instrument[1] and partly with the help of accredited external laboratories. The aim of this report is to compile and provide an overview of information and results from the analyses in our enforcement over the course of 2019. The report does not encompass those analyses that other parts of the Swedish Chemicals Agency have ordered, for example surveys of chemical substances in articles.

The regulations that the Swedish Chemicals Agency enforces are largely common to the entire EU. The legislation differentiates between *chemical products* and *articles*. Chemical products are individual chemical substances or mixtures of substances, commonly in liquid or powder form. Examples of these are paint, glue and various types of pesticides. Articles are objects where the physical form, surface or design has greater significance to their function than the chemical content, with examples such as clothing, electronics and dolls.

Appendix 1 contains brief information about the substances mentioned in the report. A brief description of the legislation mentioned in the report may be found in Appendix 2.

The Swedish Chemicals Agency's previous analyses in connection with enforcement are compiled in the reports for 2008-2013[2], 2014-2015[3], 2016[4], 2017[5] and 2018[6].

[1] XRF (X-Ray Fluorescence) is a technique based on X-rays that can measure the content of elements in certain materials.
[2] Enforcement 6/14 – The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2008-2013, October 2014 (https://www.kemi.se/global/tillsyns-pm/2014/enforcement-6-14-analyses-2008-2013.pdf)
[3] Enforcement 7/16 – The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2014-2015, October 2016 (https://www.kemi.se/global/tillsyns-pm/2016/tillsyn-7-16-analyses-2014-2015.pdf)
[4] Enforcement 7/17 – The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2016, March 2017 (https://www.kemi.se/global/tillsyns-pm/2017/enforcement-7-17-the-swedish-chemicals-agencys-analyses-in-conjunction-with-enforcement-2016.pdf)
[5] Enforcement 6/18 – The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2017, June 2018 (https://www.kemi.se/global/tillsyns-pm/2018/tillsyn-6-18.pdf)
[6] Enforcement 11/19 – The Swedish Chemicals Agency's Analyses in conjunction with Enforcement 2018, November 2019 (https://www.kemi.se/global/tillsyns-pm/2019/enforcement-11-19-the-swedish-chemicals-agencys-analyses-in-conjunction-with-enforcement-2018.pdf)

2 Analyses

The majority of the analyses ordered by the Swedish Chemicals Agency over the course of 2019 have concerned substances in articles, but a few chemical products have also been analysed. In some cases, there are separate reports, see section *3.7 Additional information*. Please note that analyses reported here do not provide a representative picture of the entire market. We select products for testing based on highest risk of containing hazardous substances and not on random sampling.

In the section below, the products have been divided into groups of products that we have prioritised for inspection[7] and in our action plan for a non-toxic everyday environment[8]. A figure depicting the analytical results appears at the end of each section.

- The number of products that do not comply with the legislative requirements is stated in red bars.
- Orange bars indicates the number of products in which substances included on the Candidate List in the REACH Regulation (read more about this in Appendix 2) are present in concentrations in excess of 0.1 per cent by weight. In the case of these products, the customer must be provided with information about the content of such substances.
- Yellow bars show how many products contain restricted substances in concentrations below the limit values or substances that are not regulated for the specific group of products but which still have hazardous properties. In a few cases, yellow may also indicate that there is an exemption for some applications or that the product was put on the market before the substance was forbidden.
- Products which did not contain any of the substances searched for in the analyses are in green bars.

The products are divided into these four groups to visualise the substances that are found in the analysis even though they are not prohibited. For some groups of products, there are very few substances that are restricted, but substances with hazardous properties can still be found in these.

The review below does not contain a detailed account of the quantity of different substances found or in which specific products these are found. For more detailed information, please see section *3.7 Additional information* or contact the Swedish Chemicals Agency.

In this year's report we have also made a compilation of which substances on the Candidate List we have found in articles; see section *2.8 Substances on the Candidate List*. Substances on the Candidate List are particularly dangerous substances that are not prohibited in all articles. If an article contains more than 0.1 per cent by weight of such a substance, the customer must be given information about the substance and recommended risk management measures. Professional customers shall receive the information without having to ask for it and private consumers have the right to receive it within 45 days of request and without charge.

[7] Tillsyn nr 4/16 - Strategi för effektiv tillsyn över kemikalier i varor, mars 2016 (http://www.kemi.se/global/tillsyns-pm/2016/tillsyn-4-16-strategi-for-tillsyn-over-kemikalier-i-varor.pdf)
[8] Handlingsplan för en giftfri vardag 2011-2014 – Skydda barnen bättre (http://www.kemikalieinspektionen.se/global/rapporter/handlingsplan-giftfri-vardag.pdf)

We have also compiled information about in which articles we have found cadmium. This is because cadmium is a harmful substance and we need to reduce exposure to it. This compilation may be found in section *2.9 Cadmium*.

2.1 Toys and childcare articles

We have tested 136 different toys and childcare articles and found prohibited concentrations of

- bis(2-etylhexyl) phthalate (DEHP), diisononyl phthalate (DINP), short-chain chlorinated paraffins (SCCPs), diisobutyl phthalate (DIBP), dibutyl phthalate (DBP), lead and cadmium in 11 plastic toys
- boron and aluminum in 17 slime products
- lead, cadmium, DEHP and SCCPs in eight electrical toys
- lead in one metal children necklace (other toys).

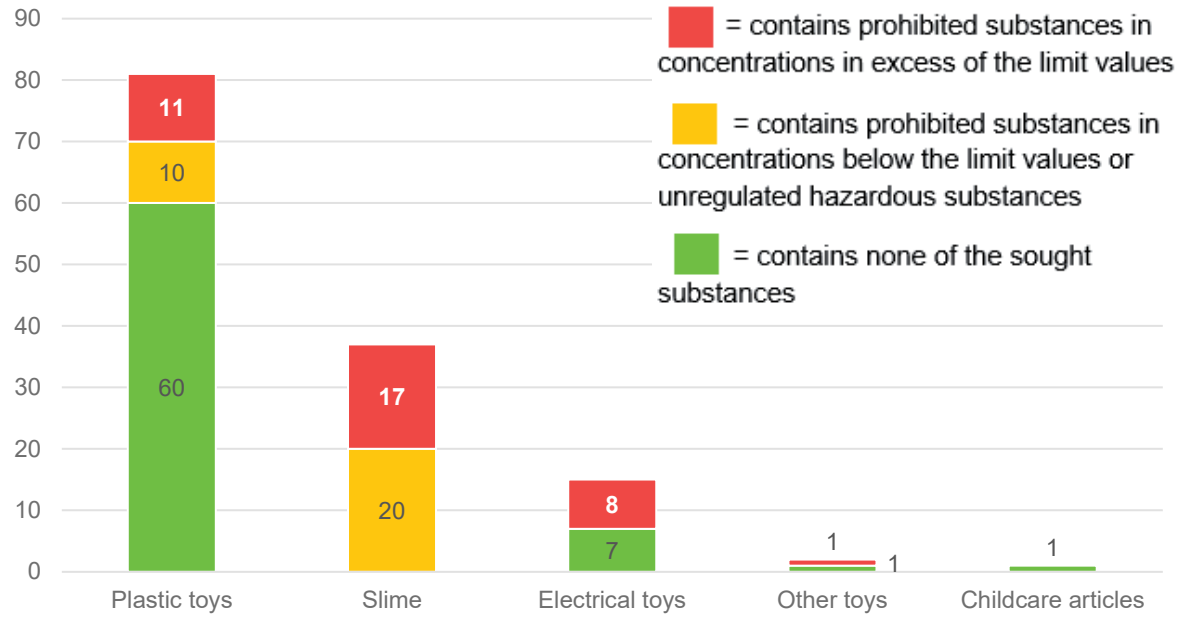

Figure 1. Toys and childcare articles that have been analysed by the Swedish Chemicals Agency during 2019.

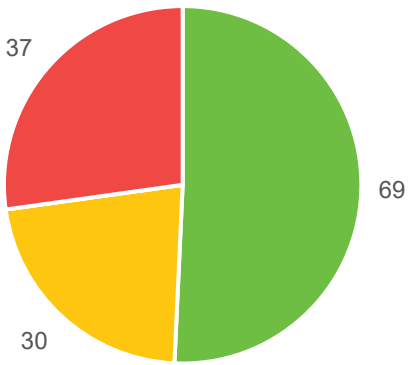

Figure 2. The number of toys and childcare articles that contained excessive levels of restricted substances (red), contained low levels or unrestricted substances (yellow) or contained none of the substances searched for (green).

2.1.1 Plastic toys

During the year we checked 81 different toys made of plastic. 11 of these contained prohibited levels of hazardous substances:

- Nine contained the softener bis(2-etylhexyl) phthalate (DEHP)
- four contained diisononyl phthalate (DINP)
- four contained short-chain chlorinated paraffins (SCCPs)
- one contained diisobutyl phthalate (DIBP)
- one contained dibutyl phthalate (DBP)
- one contained lead
- one contained cadmium.

Examples of plastic toys that contained these substances were plastic figures and dolls. In addition to the 11 toys that contained prohibited substances, we found restricted substances in a further 10, but the levels were below the limits. In the remaining 60 plastic toys we found none of the substances we were looking for.

2.1.2 Slime

We tested 37 slime products during 2019. Of those, 17 emitted too high levels of boron and one product also emitted too high levels of aluminum. In the remaining 20 slime products, lower levels of restricted substances were emitted, mainly boron, but at levels below the limit values.

2.1.3 Electrical toys

In 2019, we checked 15 electrical toys. Eight of these contained lead, two contained cadmium, two contained DEHP and one contained SCCPs in levels that exceeded the limits. In a further seven electrical toys we did not find any of the substances searched for.

2.1.4 Other toys

A metal childrens necklace controlled during 2019 contained prohibited levels of lead. The other toy within the same category, crayons, did not contain any of the substances we were looking for.

2.1.5 Childcare articles

During the year, we have analysed one childcare article, a rain cover of a stroller. The rain cover contained none of the substances searched for.

2.2 Clothing, shoes and accessories

In the category clothing, shoes and accessories, we have tested 431 articles and found prohibited levels of

- lead and cadmium in 55 jewellery articles
- lead, hexavalent chromium, SCCPs and cadmium in 11 bags and casings
- hexavalent chromium, SCCPs and lead in three gloves
- lead in a plastic watch (other accessories)
- hexavalent chromium in a watch wrist band
- SCCPs and lead in two rainwear articles.

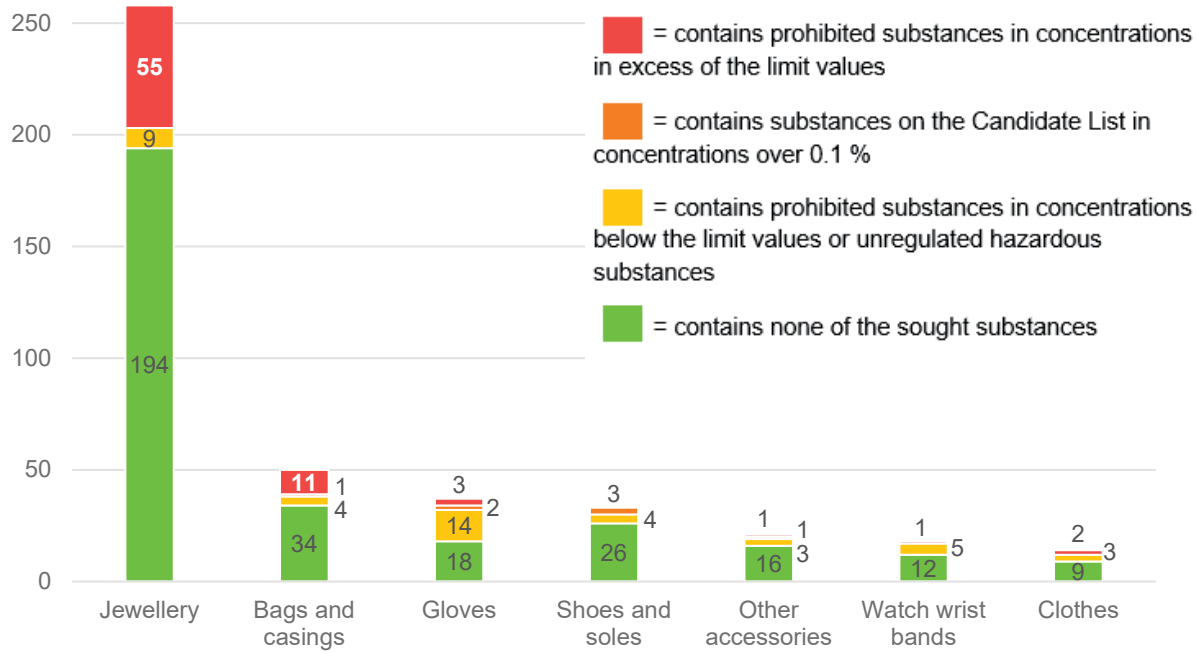

Figure 3. Clothing, shoes and accessories that have been analysed by the Swedish Chemicals Agency during 2019.

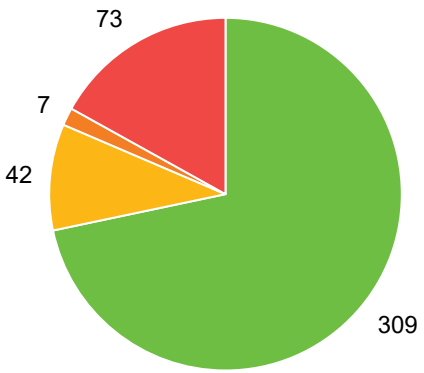

Figure 4. The number of items of clothing, shoes and accessories that contained excessive levels of restricted substances (red), contained substances on the Candidate List over 0.1% (orange), contained low levels or unrestricted substances (yellow) or that contained none of the substances searched for (green).

2.2.1 Jewellery

During the year, we have analysed 258 items of jewellery, mainly for the metals lead, cadmium and nickel. Most of these jewellery we checked directly upon import at the border. 55 items of jewellery contained lead and/or cadmium in levels above the limits (44 contained cadmium, ten contained lead and three contained both substances in too high levels). We found restricted and/or hazardous substances in a further nine items of jewellery but the levels were below the limits or the jewellery was released onto the market before the rule came into force, which means that they can still be sold. We found none of the substances we were looking for in 194 items of jewellery.

2.2.2 Bags and casings

In 2019, we checked 50 bags and casings. 11 of these contained prohibited levels of hazardous substances. Five contained lead, four contained hexavalent chromium, three contained SCCPs and two contained cadmium. Examples of such articles were casings for mobile phones and tablets and toilet bags. Four articles contained Candidate List substances at levels above 0.1 per cent by weight (DEHP, DBP, DIBP and SCCPs). These substances are not prohibited in these type of articles (SCCPs is prohibited in higher levels), but customers have the right to receive information about the content. A further four articles had low levels of hazardous substances (levels below the limits) or substances that are not regulated for this type of article. We found none of the substances we were looking for in 34 of the 50 bags and casings.

2.2.3 Gloves

We analysed 37 gloves, and three contained prohibited substances in levels above the limits (two contained hexavalent chromium, one contained SCCPs and one contained lead). Three gloves (of which one also contained prohibited substances) contained softeners (DEHP, DBP and DIP). The substances are on the Candidate List, which means that the customers have the right to receive information about the content. 14 gloves contained low levels of restricted substances and/or substances which are not restricted in this type of article. In the remaining 18 gloves we did not find any of the substances we were looking for.

2.2.4 Shoes and soles

In 2019 we analysed 33 different shoes and soles, in none of which we found restricted substances. Three plastic shoes contained substances on the Candidate List at levels above 0.1 per cent by weight (DEHP, DBP and SCCPs). Four other shoes contained low levels of restricted substances and/or substances which are not restricted in this type of article. In the remaining 26 shoes and soles we did not find any of the substances we were looking for.

2.2.5 Other accessories

We had 21 other accessories tested and in one of these, a plastic watch, we found forbidden levels of lead. In another article, a plastic keyring, we found the substance DEHP in a level over 0.1 per cent by weight, which means that customer information requirements apply even though the substance is permitted in the article. Three other articles in this category contained low levels of restricted substances and/or substances which are not restricted for this type of article.16 of the articles tested in this category contained none of the substances we were looking for.

2.2.6 Watch wrist bands

During 2019 we tested 18 watch wrist bands of leather. One of them contained too high levels of hexavalent chromium. Another watch wrist band contained hexavalent chromium but below the legal limit value, two contained the substance cobalt (which is not restricted for this type of article) and two contained nonylphenol ethoxylates in levels below the limit value. We found none of the substances we were looking for in the other 12 watch wrist bands.

2.2.7 Clothing

During 2019, we tested 14 garments, and in two rainwear articles we found forbidden levels of substances (both contained SCCPs and one also contained lead). Both rainwear articles also contained DEHP at levels above 0.1 per cent by weight, which means that customers have the right to receive information about the content. Three rainwear articles contained low levels of restricted substances and non-restricted substances. We found none of the substances we were looking for in the other nine garments.

2.3 Electrical products

We have analysed 131 electrical products and we found prohibited levels of

- lead and mercury in three batteries
- lead, cadmium and SCCPs in 14 other electrical products
- lead, SCCPs and cadmium in six lighting products
- lead, SCCPs and cadmium in six headphones
- lead and SCCPs in three electric music equipment
- lead in two cables
- lead and cadmium in six mobile phone chargers.

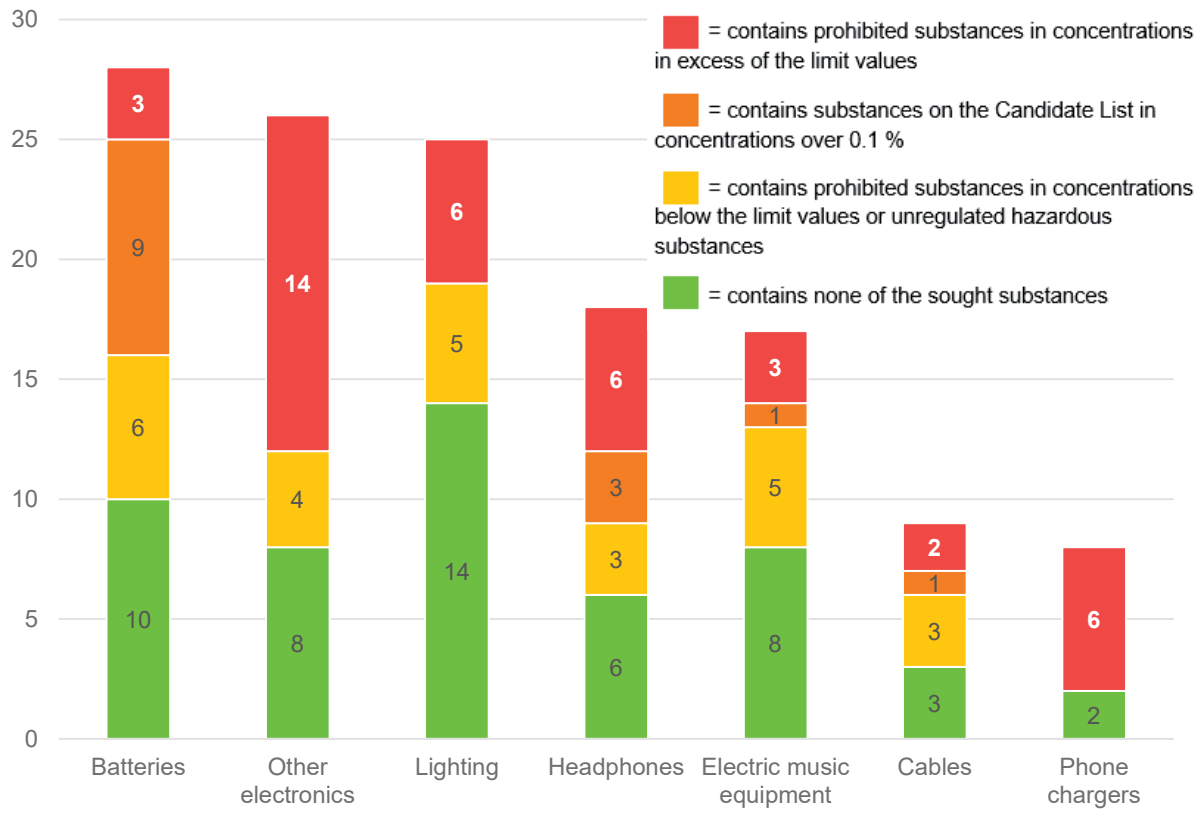

Figure 5. Electrical products that have been analysed by the Swedish Chemicals Agency during 2019.

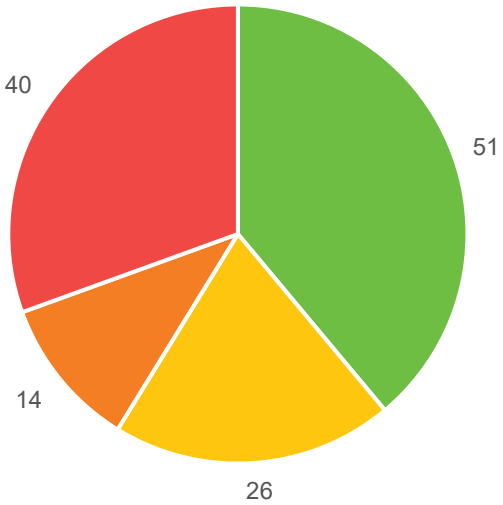

Figure 6. The number of electrical products that contained excessive levels of restricted substances (red), contained substances on the Candidate List over 0.1% (orange), contained low levels (yellow) or that contained none of the substances searched for (green).

2.3.1 Batteries

In 2019 we analysed 28 batteries. Two of these contained prohibited levels of cadmium and one contained prohibited levels of mercury. Ten batteries (one of which also contained a

prohibited substance) contained substances on the Candidate List in concentrations above 0.1 per cent by weight. These substances were 1,2-dimethoxyethane (EGDME) (found in eight batteries), 1,3-propanesultone (in three batteries) and lead (in one battery). Five batteries contained low levels of lead and one contained a low content of 1,3-propanesultone. In ten of the tested batteries, we did not find any of the substances we were looking for.

2.3.2 Other electronics

In the category other electronics, 14 of the 26 articles checked contained prohibited levels of substances. 12 articles contained lead, five contained SCCPs and one article contained cadmium. Four of these articles also contained substances on the Candidate List (the phthalates DEHP, DBP and DIBP) in levels above 0.1 per cent by weight. Four of the articles contained low levels of restricted substances (SCCPs, DEHP and lead) or substances that are not restricted for this product group (DINP). The remaining eight articles contained none of the substances we were looking for in the analyses.

2.3.3 Lighting

In 2019, we checked 25 electric lighting products and six of these contained prohibited levels of substances (four contained lead, two contained SCCPs and one contained cadmium). Two of these also contained substances on the Candidate List (DEHP in two products and DBP in one product) in such levels that information to customers is a requirement. A further five products contained low levels of restricted substances or substances that are not restricted for this product group. 14 of the 25 lighting products tested contained none of the substances searched for.

2.3.4 Headphones

In 2019, we checked 18 headphones and six contained prohibited levels of substances. Five headphones contained lead, three contained SCCPs and one contained cadmium. Five of these six headphones and a further three headphones contained substances on the Candidate List (DEHP and DBP) in such levels that information to customers is a requirement. Three headphones contained low levels of restricted substances or substances that are not restricted for this product group. The remaining six headphones contained none of the substances we were looking for in the analyses.

2.3.5 Electrical music equipment

During 2019 we controlled 17 electrical products for different types of music-related purposes, such as microphones and cables for such electronics. Three of these contained prohibited levels of substances (all three contained lead and two also contained SCCPs). Two of these and yet another product contained substances on the Candidate List at levels above 0.1 per cent by weight (all three contained DEHP and one also contained DBP). Another five products contained low levels of lead or the not restricted phthalates for this product group, DINP and DIDP. The remaining eight products contained none of the substances searched for.

2.3.6 Cables

Two of the nine cables that we tested in 2019 contained prohibited levels of lead. Another cable contained DEHP and SCCPs at levels sufficient for the customer information requirements to apply. Three cables contained low levels of restricted substances (DBP) or

substances that are not restricted for this product group (DINP and DIDP). The remaining three cables contained none of the substances searched for.

2.3.7 *Mobile phone chargers*

Six of the eight mobile phone chargers that we checked in 2019 contained prohibited levels of lead and one of them also contained prohibited levels of cadmium. We found none of the substances we were looking for in the other two mobile phone chargers.

2.4 Building materials and furnishings

We analysed 37 furnishing articles. Of these, we found prohibited levels of

- SCCPs and lead in two furnishing articles.

Figure 7. Building materials and furnishings that have been analysed by the Swedish Chemicals Agency during 2019.

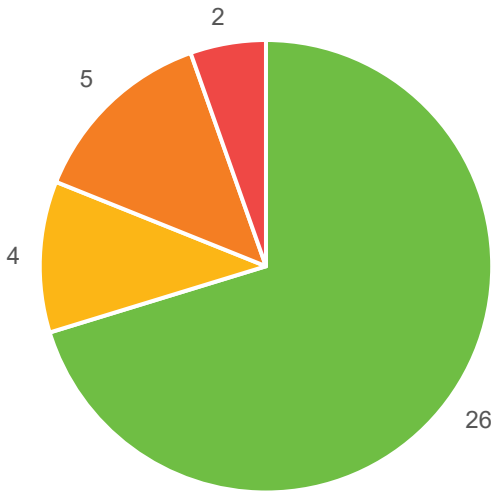

Figure 8. The number of items of building materials and furnishings that contained excessive levels of restricted substances (red), contained substances on the Candidate List over 0.1% (orange), contained low levels or unrestricted substances (yellow) or that contained none of the substances searched for (green).

2.4.1 Other furnishings

During the year we analysed 23 other kinds of furnishing articles. This category includes various types of interior decoration products, such as hooks, door handles, pillows with plastic print and placemats. Two of these, wall hooks with suction plugs and a metal napkin ring, contained prohibited levels of substances (SCCPs and lead, respectively). Four of the items, including the wall hooks, contained substances on the Candidate List at levels above 0.1 per cent by weight (lead or DEHP). One product contained a low level of lead and the phthalate DINP that is not restricted for this product group. The remaining 17 products in the category did not contain any of the substances searched for.

2.4.2 Bathroom articles

In 2019, we checked 14 bathroom articles, mainly those made of soft plastic. None of these contained prohibited levels of substances, but two contained the substance DEHP, which is included on the Candidate List, in concentrations above 0.1 per cent by weight. Three bathroom articles contained low levels of restricted substances or substances that are not restricted for this product group. In the remaining nine bathroom articles, we did not find any of the substances we were looking for.

2.5 Sports and leisure equipment

We analysed 128 sports and leisure articles in which we found prohibited levels of

- SCCPs in four sports and leisure articles
- SCCPs and polycyclic aromatic hydrocarbons (PAHs) in a shot belt (“other articles”)
- cadmium in a fishing lure.
- lead in a water hose
- SCCPs in a bicycle saddle cover

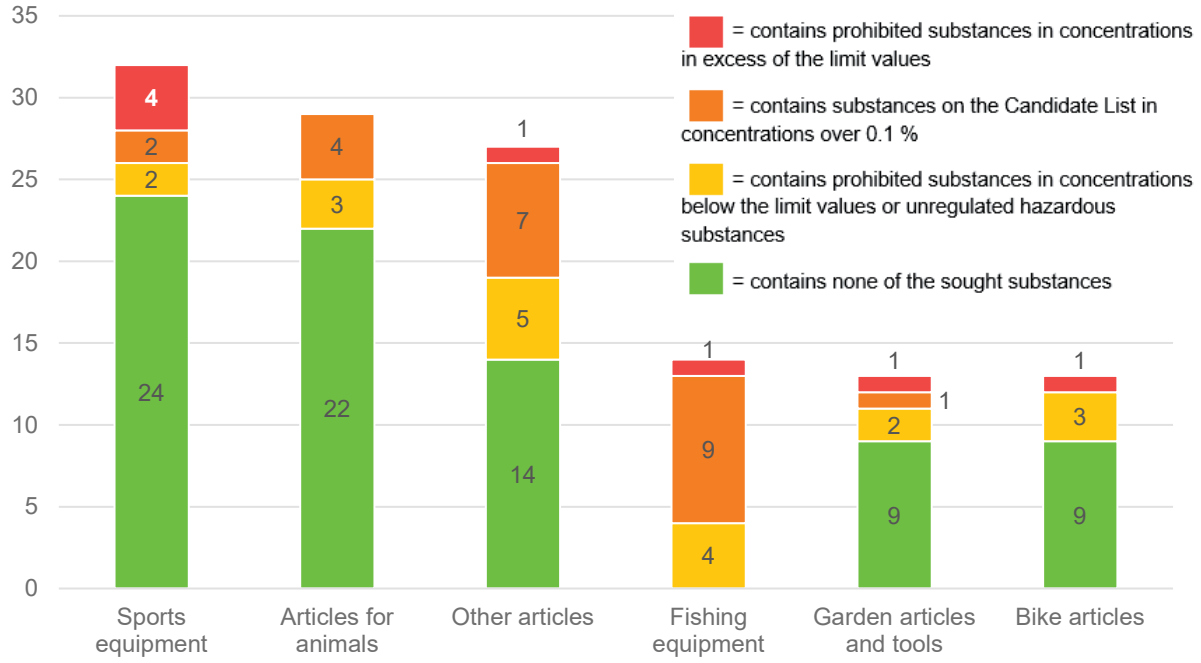

Figure 9. Sports and leisure articles that have been analysed by the Swedish Chemicals Agency during 2019.

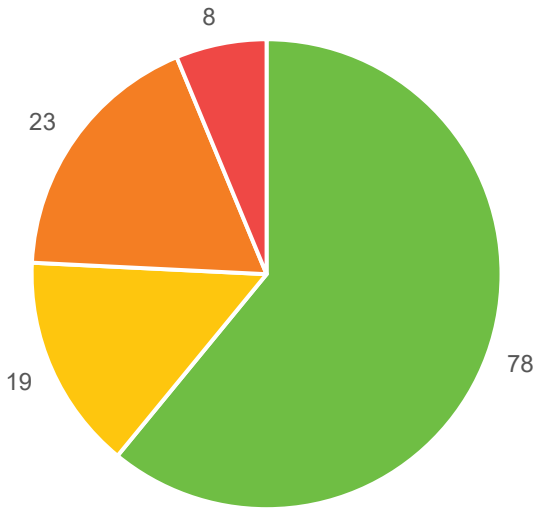

Figure 10. The number of sports and leisure articles that contained excessive levels of restricted substances (red), contained substances on the Candidate List over 0.1% (orange), contained low levels or unrestricted substances (yellow) or that contained none of the substances searched for (green).

2.5.1 Sports equipment

During the year, we analysed 32 sports equipment, primarily of soft plastic, and four of them contained SCCPs in prohibited levels. Three sports equipment (one also contained SCCPs in

prohibited levels) contained substances on the Candidate List (DEHP, DBP, DIBP and SCCPs) in such levels that information to customers is a requirement. One product contained DEHP at a low level and another contained the unrestricted phthalate DINP. The remaining 24 items in the category did not contain any of the substances searched for.

2.5.2 Articles for animals

None of the 29 controlled articles in this category contained restricted substances at levels above the limit. However, there were four products that contained substances on the Candidate List (DEHP and DIBP) at levels above 0.1 per cent by weight. A further three products contained low levels of restricted substances. The other 22 products did not contain any of the substances searched for.

2.5.3 Other articles

In 2019, we checked 27 products in the category other articles. Of these 27 products, a shot belt contained prohibited levels of restricted substances (SCCPs and PAHs). Eight products (of which the shot belt was one) contained substances listed on the Candidate List at levels above 0.1 per cent by weight (DEHP, lead and azodicarbonamide (ADCA)). Five additional products in this category contained low levels of restricted substances or substances not restricted for this product group. The remaining 14 articles did not contain any of the substances we were looking for.

2.5.4 Fishing equipment

We have controlled 14 fishing related articles, mainly fishing lures of soft plastic (so-called jigs). One of these jigs contained cadmium above the restricted substance level. 10 jigs (one of these was the one containing cadmium) contained the substance DEHP at levels above 0.1 per cent by weight. One also contained DBP above 0.1 per cent by weight. Another four fishing lures contained low levels of DEHP or DIBP or the unrestricted phthalates DINP and DIDP.

2.5.5 Garden articles and tools

During the year we tested 13 garden articles and tools. Two water hoses contained the substance DEHP, which is included on the Candidate List, in concentrations above 0.1 per cent by weight. One of the water hoses also contained a prohibited level of lead. The handles of two different tools contained low levels of restricted or unrestricted substances. In the remaining nine articles in this category, we did not find any of the substances we were looking for.

2.5.6 Bike articles

In 2019, we checked 13 different bicycle accessories, mainly bicycle handles and saddle covers. A saddle cover contained too high levels of SCCPs and also DEHP, which is included on the Candidate List, above 0.1 per cent by weight. Three bicycle accessories contained low levels of restricted or unrestricted substances. The other nine bicycle accessories did not contain any of the substances we were looking for.

2.6 Chemical products

We have analysed 45 chemical products and found no restricted substances in any of these.

2.6.1 Laundry and dishwasher detergents

During the year we analysed 17 laundry detergents and eight dishwasher detergents regarding the content of phosphorus. None of the detergents tested contained a too high level.

2.6.2 Plant protection products

During the year, we analysed 20 plant protection products regarding the content of active substance, possible contaminants and certain physical properties such as pH, appearance and density. The purpose is to ensure that the products comply with the approval decision and that there are no illegal products on the Swedish market. When this report is published, we have an ongoing enforcement case for one product, none of the other 19 plant protection products tested had any non-compliances.

2.7 Packaging

We analysed one packaging and in this we found a prohibited level of cadmium.

2.7.1 Packaging

When we test articles, we also test the packaging of the articles. In 2019, we found one plastic packaging that contained a prohibited level of cadmium. The packaging also contained the substance DEHP, which is included on the Candidate List. We only register packaging analyses when we find prohibited levels, which means that we control more packaging than is shown in this report. Most of the packaging we test does not contain prohibited levels of restricted substances.

2.8 Substances on the Candidate List

Substances with especially hazardous properties may be added to what is known as the Candidate List. These are substances that can cause cancer or harm to genetic material or that can have a negative effect on the ability to have children. They may also be harmful to the environment or have other serious effects. At present, there are about 200 substances on the Candidate List.

If an article contains more than 0.1 per cent by weight of such a substance, the customer must be given information about the substance and recommended risk management measures. Professional customers shall receive the information without having to ask for it and private consumers have the right to receive it within 45 days of request and without charge.

When we perform analyses, we are looking for both prohibited substances and substances on the Candidate List. In the review of products in this report, the articles that contain substances on the Candidate List at levels above 0.1 per cent by weight are shown in orange in the figures. However, in many cases articles that contain prohibited substances also contain substances on the Candidate List. In the figure below, we have compiled the substances on the Candidate List that we have found at levels above 0.1 per cent by weight, including the articles that also contain prohibited substances.

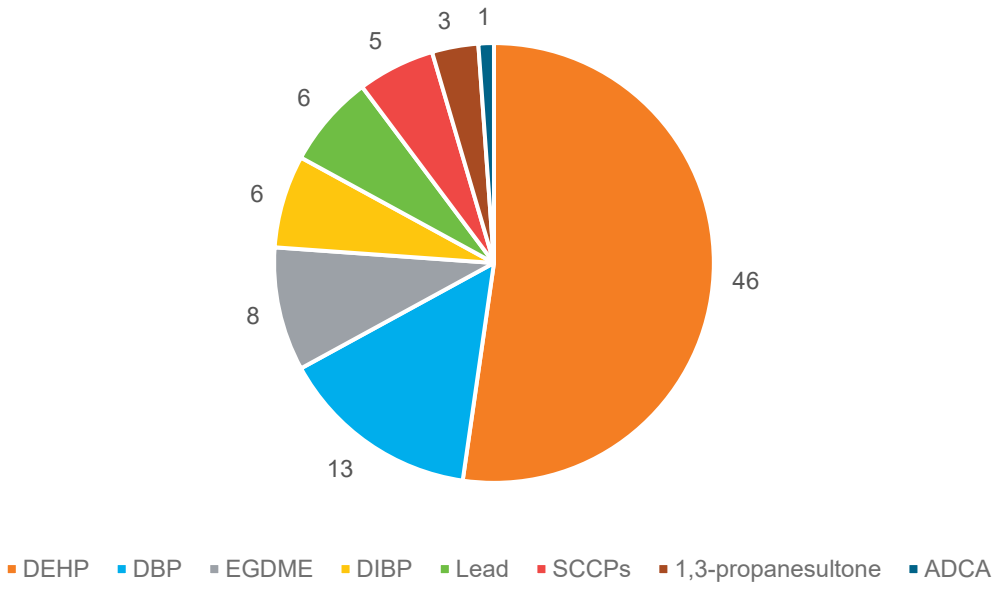

Figure 111. The figure shows which substances on the Candidate List we have found in articles we checked in 2019, as well as how many articles we found them in.

In total, we found substances on the Candidate List (in concentrations above 0.1% by weight) in 76 articles. In 2019, we have analysed a total of 829 products and for most of these analyses we have been looking for substances on the Candidate List. When analysing chemical products, such as slime products, detergents and plant protection products, we do not look for such substances. In the analysis of certain types of articles, we have not searched for substances on the Candidate List, as it has not been relevant to that type of material. In addition, for some groups of articles, most substances on the Candidate List are prohibited, for example for toys. Therefore, it is difficult to say how many products we have analysed in relation to substances on the Candidate List and therefore also difficult to say the percentage of the articles that contained such substances.

The substance on the Candidate List that we have found most often during 2019 is the phthalate DEHP. DEHP is a softening plastic additive and is primarily used in the manufacture of soft PVC plastic outside the EU. We found DEHP at levels above 0.1 per cent by weight in 46 articles in which it is not prohibited (DEHP is prohibited in toys and childcare articles and also in electrical products from July 22, 2019). We mainly find DEHP in articles made of soft PVC plastic, such as bags, fishing lures, and cables for electrical products.

Other substances on the Candidate List that we found in articles are the phthalates DBP and DIBP, which are used in the same way as DEHP. We found these in 13 and six articles, respectively.

We found the substances EGDME and 1,3-propane sultone in batteries (eight and three cases, respectively). These substances are used in certain types of batteries and in normal use they should not pose a risk to the user of the battery.

Lead is included on the Candidate List and we found it in six articles where lead is not restricted. Lead is restricted in electrical products and in small articles that can be placed in the mouth by children.

Five products contained SCCPs at levels sufficient for the customer information requirement to apply. SCCPs are prohibited in articles at levels above 0.15% by weight. Between 0.1 and

0.15% by weight, the substances are allowed but is subject to the customer information requirement. The substance is used as plasticizer and flame retardant in PVC plastic manufacture outside the EU.

We found the substance ADCA in a foamed plastic product, a sleeping mat. ADCA is used as a blowing agent in the manufacture of foamed plastic and if the manufacturing process is performed correctly, the substance should not remain in the final product.

2.9 Cadmium

Cadmium is a heavy metal that has a number of hazardous properties. At low levels, there is mainly a risk of negative effects to the kidneys and skeleton. According to a report from a government commission performed by the Swedish Chemicals Agency in 2011[9], part of the Swedish population has levels of cadmium in their bodies that could affect the skeleton and kidneys. It is therefore important to reduce exposure to cadmium.

People are mainly exposed to cadmium through the food we eat and through smoking. Cadmium in articles such as jewellery and electronics is probably of little significance in terms of direct exposure, unless for instance a piece of jewellery containing cadmium is swallowed. However, the existence of cadmium in articles means that the substance is still found in the material cycle and there is a risk of it ending up in new products or having a negative effect on people and the environment when the articles become waste. Among other things, cadmium is restricted in electronics, jewellery, plastic articles and toys.

The figure below gives an overview of the types of articles we have checked in 2019 that contained cadmium. All products contained cadmium in levels above the restricted limit value for the specific product type. The product group where most articles (50) contain cadmium is *clothing, shoes and accessories.* 48 of these items were jewellery and the other two were a pencil case and a wallet made of PVC plastic. In the category *electrical products* there are six articles containing cadmium, it is most often solders inside the products that contains cadmium. In the category *toys and childcare articles* there are three articles containing cadmium, two of which were electrical toys where the cadmium was in the solder and one was a plastic figure made of PVC plastic. *Sports and leisure equipment* had one article, a fishing lure made of soft plastic, that contained cadmium. There was also one packaging that we checked during the year that contained cadmium.

[9] Rapport 1/11 Kadmiumhalten måste minska – för folkhälsans skull, januari 2011 https://www.kemi.se/global/rapporter/2011/rapport-1-11.pdf

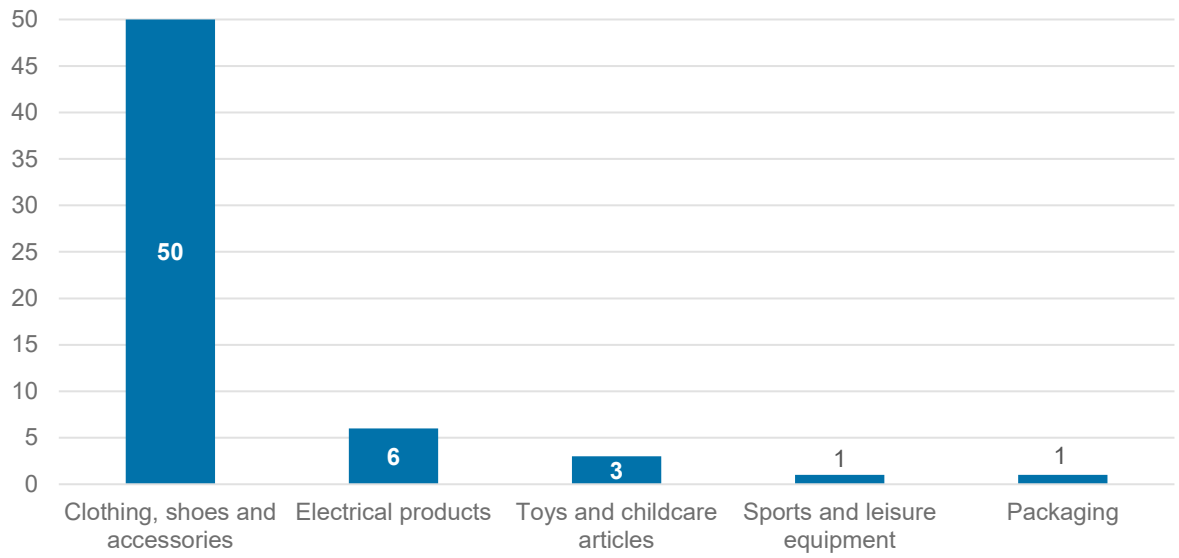

Figure 122. The figure shows the product groups that we checked during 2019 that contained cadmium.

3 Discussion

3.1 Overview of the Swedish Chemicals Agency's analyses

During 2019, we have analysed 911 articles and chemical products in conjunction with enforcement. The figure below shows how many products in the different categories we have analysed and the results.

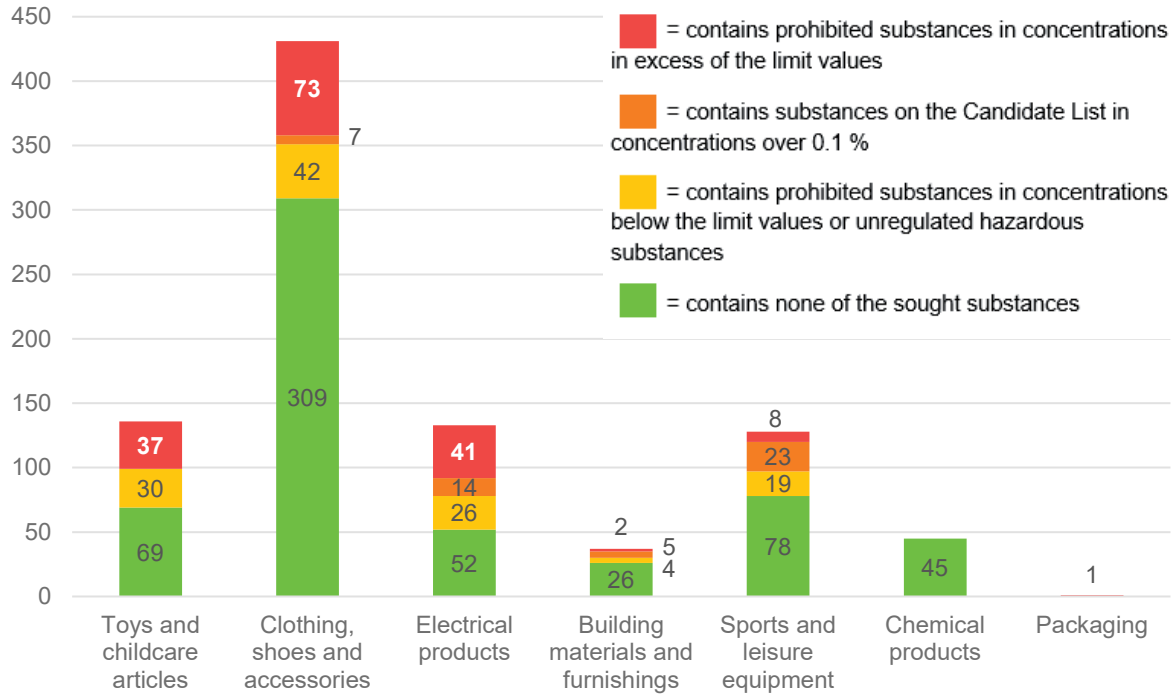

Figure 133. Number of articles (of various types) and chemical products that the Swedish Chemicals Agency has analysed during 2019. The analysed packaging contained a prohibited substance and the bar should therefore be red, but that is not possible to see in the figure.

The categories in which we have analysed most articles are *clothing, shoes and accessories.* One reason for this is that we performed an enforcement project in collaboration with the customs where we checked a large number of jewellery.

The product group where we found the highest proportion of non-compliance is *electrical products*. 31 per cent of the products in this category contained restricted substances at levels above the limit values. Even in previous years, this product group has had a similar proportion of non-compliance. The product group where we found the smallest percentage of products containing prohibited substances was *chemical products*. None of the chemical products we tested contained prohibited substances.

Overall, 162 of the 911 articles and chemical products that we analysed in 2019 contained prohibited substances above the permitted level, which corresponds to 18 per cent. In previous compilations, the proportion of products with prohibited substances has been between 14 and 18 per cent. This indicates a largely unchanged percentage of products that contain prohibited chemical substances, even though there may be considerable variation in the different product groups depending on what selection we make. Figure 14 shows the proportion of the analysed products in 2019 that contained prohibited substances (red),

substances on the Candidate List (orange), low levels of restricted substances or unrestricted substances (yellow) or none of the substances searched for (green).

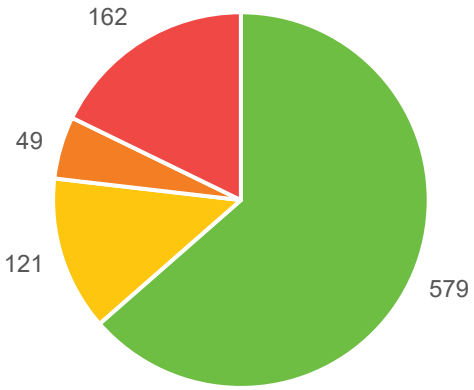

Figure 14. The distribution of all products that we analysed in 2019 that contained excessive levels of restricted substances (red), substances on the Candidate List (orange), low levels or unrestricted substances (yellow) and that contained none of the substances searched for (green).

Figure 15 below shows the proportion of products, in different product groups, that our analyses have shown to contain excessive levels of restricted substances between 2014 and 2019. The product group that had the largest proportion of articles containing substances above the limits (except for 2018) was *electrical products.* The product group *chemical products* had the lowest proportion of products with substances over the limit.

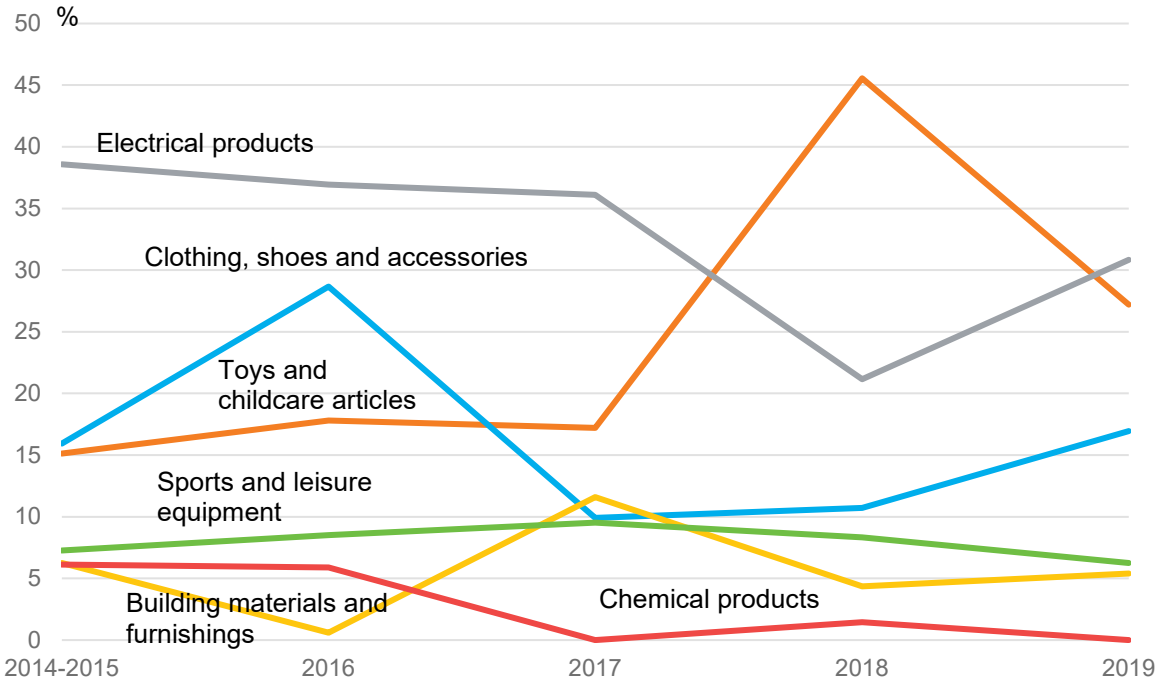

Figure 15. The proportion of products in different categories that our analyses have shown to contain excessive levels of restricted substances between 2014 and 2019.

The reason why some product groups have a high respectively low proportion of products with prohibited substances can be discussed. Partly it may be that some product groups are

subject to a greater number of substance restrictions and it is therefore easier to find restricted substances in them. This may be the case with electrical products, toys and childcare items, as those product groups are subject to specific substance restrictions that do not apply to other types of articles. It may also be that the production of certain articles takes place in countries outside the EU where EU restricted substances are still allowed to be used, even though they are not allowed to be placed on the EU market. In the case of electrical products manufactured outside the EU, it still seems relatively common to use lead in the solder, since it has good technical properties, although lead has been limited in electrical products in the EU since 2006. Another reason may be that regulatory authorities have more knowledge and experience of certain product groups and can therefore more easily find prohibited substances in them.

When it comes to chemical products, we perform relatively few analyses, since we mainly check the products' classification and hazard information through documentation of the content and packaging labelling.

3.2 Substances on the Candidate List

Our review of articles' content of substances on the Candidate List shows that there are many articles sold to consumers in Sweden that contain such substances. It is mainly articles made of soft PVC plastic in which we find these substances.

These substances are placed on the Candidate List because they are candidates for being covered by a requirement for authorisation to be used within the EU. Authorisations are already required today for many of the substances on the Candidate List. However, if an article is manufactured outside the EU the requirement for an authorisation does not apply. Instead, there is only a requirement to inform the customer of the article about the content (consumers only on request). Our controls show that customers very seldom actually receive this information. The most common reason for this is that the company that sells the article does not know what it contains.

The vast majority of the articles in which we find substances on the Candidate List are manufactured outside the EU, most often in China. The manufacturers are not obliged to tell the companies they sell to about the content; instead it is the EU based companies that must require this from the manufacturers. They can set a requirement either that they must receive information if articles contain substances on the Candidate List or that the articles shall not contain such substances at all. In the case of consumer products, in most cases, these days there are well-functioning alternatives to these substances.

The substance on the Candidate List that we find most often is the phthalate DEHP. With effect from mid-2020, this and three other phthalates will be prohibited at levels above 0.1 per cent by weight in many kinds of consumer goods. This restriction will also apply to articles manufactured outside the EU. The fact that many articles presently contain high levels of DEHP, despite the fact that it has been on the Candidate List since 2008, indicates that many articles are likely to be in breach of the new restriction when it starts to apply.

3.3 Cadmium

Cadmium is a hazardous substance that we wish to remove from our material cycle. However, we can see from our compilations that many kinds of consumer articles contain cadmium. During 2019, we have found cadmium in jewellery, electrical products, a pencil case, a wallet, a plastic toy, a fishing lure and in one item of packaging.

In our enforcement over the coming years we will focus especially on the presence of cadmium in an attempt to reduce people's and the environment's exposure to it.

3.4 What do the analyses lead to?

The main purpose of our analyses is to check whether companies, and others, that put products on the Swedish market comply with the legislation. In some cases, the analyses of samples are part of a larger inspection effort in which the company's internal controls are also reviewed. In other cases, the analyses are the primary focus of the inspection.

When the analytical results are ready, we inform the company about the results. In those cases where substances have been found in concentrations that exceed the limit value set out in the legislation, the company is requested to provide an account of the measures it will be taking. In those cases where a company does not withdraw its product from the market voluntarily, the Swedish Chemicals Agency can order a sales ban. For those regulatory violations that are within the scope of the Environmental Code, the Agency is obliged to submit a report to the environmental prosecutor. The prosecutor then assesses whether a preliminary investigation is to be initiated. In some cases, this leads to the company being fined or to a prosecution[10].

If companies in other countries are affected by the analytical results (e.g. if the supplier of the product is based in another EU country) we contact the enforcement authority in that country so that it can take measures. Hazardous products are also reported to Safety Gate[11] or ICSMS[12] so that other authorities, companies and consumers can obtain information and take measures themselves. These two databases are used by EU regulators to report products with deficiencies.

3.5 How can the results be used?

The analytical results are primarily used in our operational enforcement activities, which involve checking whether articles and products comply with the requirements. This means that we check that products sold on the Swedish market do not contain prohibited substances, and in cases where they do, those who sell them must take measures.

The analytical results can also be used to develop legislation. This may be done when new regulations are being drawn up or existing ones are reviewed. In Forum's[13] working group for restrictions, the EU member states are to provide their points of view on proposals for future restrictions. The Swedish Chemicals Agency's experience is that analyses and enforcement results make a major contribution in providing good feedback on new proposed restrictions.

Analytical results can also be distributed to other actors that may have an interest in them. One example is companies that need to ensure that their own articles do not contain prohibited substances. Our analytical results can provide information about which substances

[10] More information about the Swedish Chemicals Agency's prosecutions may be found in Tillsyn 10/17 – Kemikalieinspektionens åtalsanmälningar 2012-2016 https://www.kemi.se/global/tillsyns-pm/2017/tillsyn-10-17-kemikalieinspektionens-atalsanmalningar-2012-2016.pdf

[11] Safety Gate = Rapid Alert System for non-food dangerous products. A joint EU system in which market control authorities in the EU notify of dangerous products. https://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/?event=main.listNotifications

[12] A joint EU system in which market control authorities in the EU notify of controlled products. https://webgate.ec.europa.eu/icsms/?locale=sv

[13] The forum for information exchange on coordinating enforcement issues regarding Reach and CLP regulations.

can be found in different types of articles and materials. The economic operators can use this information to focus their internal control resources on those articles, products and provisions that are most relevant. Comprehensive analyses are relatively expensive for an individual business and to get help to focus on the correct areas is thus of value.

Other enforcement authorities may also find this information useful. This is done via Safety Gate (formerly Rapex), where EU member states report products posing a risk to health and safety of consumers. We also distribute information about analytical results in our enforcement guidance to municipal authorities, which can have a supervisory function in this area.

3.6 Future need of analyses

In terms of analyses, they will continue to be primarily performed on consumer products, and mainly those that have a lower price. Experiences from our enforcement activities show that it is mainly in the cheaper and/or low-quality product range where we find products that contain prohibited hazardous substances. We also base our selection on what materials the articles are made of and choose materials where we know there is a greater risk of finding hazardous and prohibited substances.

We have published a strategy for enforcement of chemicals in articles[14] and in this we prioritise different categories of articles, the same as the categories found in this report. Analyses will continue to be made primarily on the product groups in this strategy.

The Swedish Chemicals Agency intends to continuously publish the results from the analyses in our enforcement projects, partly in the form of compilations such as this report and partly as separate reports for each project.

3.7 Additional information

For more information about substances and rules, see www.kemikalieinspektionen.se.

Reports from the Swedish Chemicals Agency's enforcement projects[15] that are referred to in this report:

- Tillsyn 9/19 – Kemikalieinspektionens analyser i samband med tillsyn 2018
- Tillsyn 5/18 – Kemikalieinspektionens analyser i samband med tillsyn 2017
- Tillsyn 6/17 – Kemikalieinspektionens analyser i samband med tillsyn 2016
- Tillsyn 1/16 – Kemikalieinspektionens analyser i samband med tillsyn 2014–2015
- Tillsyn 5/14 – Kemikalieinspektionens analyser i samband med tillsyn 2008–2013

There is more information on our enforcement activities in the Swedish Chemicals Agency's annual reports[16].

[14] Tillsyn 4/16 - Strategi för tillsyn över kemikalier i varor
https://www.kemi.se/global/tillsyns-pm/2016/tillsyn-4-16-strategi-for-tillsyn-over-kemikalier-i-varor.pdf
[15] http://www.Kemikalieinspektionen.se/hitta-direkt/publikationer/tillsynsrapporter
[16] https://www.kemi.se/om-kemikalieinspektionen/vart-uppdrag/var-budget-och-finansiering/arsredovisningar-och-budgetunderlag

4 Appendices

Appendix 1 – Substances

Group of substances	Examples of substances	Description
Phthalates	DEHP (di(2-ethylhexyl) phthalate) DBP (dibutyl phthalate) BBP (benzylbutyl phthalate) DINP (diisononyl phthalate) DIDP (diisodecyl phthalate) DNOP (di-n-octyl phthalate) DIBP (diisobutyl phthalate)	Phthalates are used as plasticisers in plastics, primarily polyvinyl chloride. Certain phthalates are toxic for reproduction, have environmentally hazardous properties or can have other negative effects on the human body. These are restricted in toys and child care articles and some are on the Candidate List. DEHP, DBP, BBP and DIBP are from 22 July 2019 also restricted in electrical products.
Short-chain chlorinated paraffins	SCCPs	Plasticising and flame retardant substances that are used in plastics, primarily polyvinyl chloride. SCCPs are hazardous to aquatic organisms, do not decompose in nature and are suspected carcinogens. SCCPs are restricted in all types of products and is also on the Candidate List.
Metals and other chemical elements	Lead Cadmium Nickel Mercury Chromium Cobalt Aluminum Boron Phosphorus	The metals lead, cadmium, nickel, mercury, chromium, cobalt and aluminum are used in various alloys or as salts in plastics or other materials. Lead, cadmium and nickel are restricted in jewellery. Lead, cadmium, mercury and hexavalent chromium are restricted in electrical products. Hexavalent chromium is restricted in leather articles. Also cobalt can be present in leather articles but is not restricted. Boron and aluminum can be present in slime. The phosphorous content is restricted in laundry and dishwasher detergents.
Substances on the Candidate List	1,2-Dimethoxyethane (EGDME) 1,3-propane sultone ADCA (Azodicarbonamide) Nonylphenol ethoxylates (NPEO)	EGDME and 1,3-propane sultone are used in some types of button cell batteries. In normal use, consumers do not come into contact with the substances. ADCA is used as a blowing agent in the manufacture of foamed plastic. It may cause allergy or asthma symptoms or breathing difficulties if inhaled. When manufactured correctly, the substance should not remain in the final product. NPEO is used in the manufacture of textiles and can be harmful to aquatic organisms.
Polycyclic aromatic hydrocarbons (PAHs)		A large group of substances that are formed unintentionally during incomplete combustion or are present as pollutants in rubber and plastic. Several of them have carcinogenic properties.

Appendix 2 – Legislation

Legislation that regulates the substances mentioned in the report is listed below.

EU regulations
Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning Registration, Evaluation, Authorisation and Restriction of Chemicals (**REACH**)
Regulation (EC) No 850/2004 of the European Parliament and of the Council concerning Persistent Organic Pollutants (**POPs**) Regulation (EU) No 2019/2021 of the European Parliament and of the Council concerning Persistent Organic Pollutants (**POPs**) (recast)
Regulation (EC) No 1107/2009 of the European Parliament and of the Council on the placing of **plant protection products** on the market
Regulation (EC) No 648/2004 of the European Parliament and of the Council on **detergents**
EU directives imposed into Swedish regulations
Directive 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (**RoHS**) This directive has been imposed into Swedish legislation through the Regulation (2012:861) regarding hazardous substances in electrical and electronic equipment. The provisions are found within the framework of the Environmental Code in the Regulation (1998:944) regarding prohibitions etc. and in the Swedish Chemicals Agency's Regulation (KIFS) 2017:7.
Directive 2009/48/EC of the European Parliament and of the Council on the **safety of toys** This directive has been imposed into Swedish legislation through the Act (2011:579) on the safety of toys and the Regulation (2011:703) on the safety of toys, as well as the Swedish Chemicals Agency's Regulation (KIFS 2017:8) on chemical products and biotechnical products.
Directive 94/62/EC of the European Parliament and of the Council on **packaging** and packaging waste This directive has been imposed into Swedish legislation through the Act (1998:44) on prohibition etc. in certain cases in connection with the handling, import and export of chemical products.
Directive 2006/66/EC of the European Parliament and of the Council on **batteries and accumulators** and waste batteries and accumulators This directive has been imposed into Swedish legislation through the Act (1998:44) on prohibition etc. in certain cases in connection with the handling, import and export of chemical products.

The REACH Regulation (EC) no. 1907/2006

The REACH Regulation is the EU's most extensive regulation for chemicals and includes rules for individual substances, substances in mixtures and substances in articles.

Among other things, the regulation contains about seventy restrictions in which specific substances are restricted in various kinds of products and articles. These restrictions are found in Annex XVII and in most cases there are limits that show what levels of each substance are prohibited. Examples of restrictions that the Swedish Chemicals Agency has investigated using analyses include phthalates in plastic toys, and cadmium, lead and nickel in jewellery.

The REACH Regulation also contains requirements for information about certain substances in articles. There is a requirement that customers of a product that contains more than 0.1 per cent by weight of a substance of very high concern (found on the so-called Candidate List) must be informed of this.

POPs Regulation (EC) No 850/2004 / (EU) nr 2019/2021

This regulation restricts a number of persistent organic pollutants (POPs). The restrictions apply to the pure substance, the substance in mixtures and the substance in articles. In most cases there is no specified limit, but very low levels of unintentional trace contaminants are not prohibited. Examples of substances that are restricted include hexachlorobenzene (HCB) which may be found in fireworks and short-chain chlorinated paraffins (SCCPs) which may be found in, for instance, soft plastics.

On 15 July 2019, Regulation (EU) 2019/1021 on persistent organic pollutants replaced the original Regulation (EC) No 850/2004. The new regulation includes, among other things, adaptations to the REACH regulation. In Annex I, the brominated flame retardant decabromodiphenyl ether (decaBDE) has been introduced. This means that the POPs regulation limits the use of decaBDE in articles and chemical products. The new regulation also gives the European Chemicals Agency (ECHA) some administrative tasks.

Plant Protection Product Regulation (EC) No 1107/2009

This EU regulation establishes rules for releasing plant protection products onto the market. It contains rules stating that plant protection products and the active substances that they contain must be approved before they can be released onto the market.

Regulation (EC) No 648/2004 on detergents

The Detergent Ordinance is intended to reduce environmental risks with detergents and improve information to consumers. The regulation applies to all chemical products used to clean solid surfaces, clothing, textiles, and household utensils. Among other things, the regulation limits the amount of phosphorus such agents may contain.

RoHS Directive 2011/65/EU

The RoHS Directive includes rules that restrict the presence of certain substances in electrical and electronic products. The substances that are restricted are cadmium, lead, mercury, hexavalent chromium and the two groups of brominated flame retardants polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs). From 22 July 2019, the phthalates DEHP, DBP, BBP and DIBP are also restricted in this directive. The upper limit is 0.1 per cent by weight for all these substances except cadmium, where the limit is 0.01 per cent by weight.

Toy Safety Directive (2009/48/EC)

The EU directive on toy safety includes several requirements for chemicals in toys. Among other things, there are limits for how much of certain metals can migrate from toys, restrictions on the level of CMR substances (classified as carcinogenic, mutagenic or toxic for reproduction) and fragrances. An example of a CMR substance that could be found in toys is diisobutyl phthalate (DIBP). The directive also has requirements for the flammability of toys, which is also part of the Swedish Chemicals Agency's regulatory area.

The Packaging Directive 94/62/EC

Within the EU, there are rules for collection and restrictions on chemical substances used in packaging and packaging waste. Lead, cadmium, mercury and hexavalent chromium are substances that are restricted in packaging.

The Battery and accumulators Directive 2006/66/EC

The Directive 2006/66/EC on batteries and accumulators contains rules on the prohibition of placing batteries and accumulators on the market if they contain over a certain limit of the heavy metals mercury and cadmium.

KEMI
Kemikalieinspektionen

PO Box 2, 172 13 Sundbyberg
08-519 41 100

Street and delivery address
Esplanaden 3A, 172 67 Sundbyberg

kemi@kemi.se
www.kemikalieinspektionen.se