Heavy metals in dyes: past, present and future

Convegno „REACH e sostenibilità“

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Summary

- ETAD: who are we?

- The first steps of heavy metals control in dyes

- Current regulatory status

- Standards: the unofficial regulators

- Current trends and new issues

ETAD: who are we?

- ETAD is the Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers
- Founded in 1974, the association is a group of responsible producers of colorants, who aim to improve constantly the safety of their products
- Our activities are based on updated colorant-related information and on collaboration with all the other stakeholders in the different value chains of our products

Our members


ARCHROMA
Atul
touching lives...
BASF
We create chemistry
CHT
SMART CHEMISTRY WITH CHARACTER.
Cappelle
CCT
CLARIANT
CINIC
Quality Pigments Producer In China
COLOR ROOT
colourtex
The Dyestuff Company
Dainichiseika
dic
DyStar
Everlight Chemical
Farbchemie Braun
heubach
COMPETENCE IN COLOR
HUNTSMAN
JAY
Chemical Industries Limited
Matex
M.DOHMEN
MEGHMANI DYES AND INTERMEDIATES LTD.
NIPPON KAYAKU
OGD
Oriental Giant Dyes & Chem.
OHYOUNG
Pidilite
SENSIENT
Setas
COLOR CENTER
SUDARSHAN
SunChemical
Synthesia
Chemistry for the future
Thai Ambica Chemicals Co Ltd
TFL
TOYOCOLOR
yorkshire

On overview of our network (I)

National / international associations

Cefic	European Chemical Industry Council
CDIA	China Dyestuff Industry Association
CPMA	Color Pigments Manufacturers Association
EC	European Commission
EuPIA	European Printing Ink Association
Euratex	European Apparel and Textile Confederation
Eurocolour	European Association of Pigments Manufacturers
ICC	Indian Chemical Council
JDICA	Japan Dyestuff and Industrial Chemical Association
SDC	British Society of Dyers and Colourists
SOCMA	Society of Chemical Manufacturers and Affiliates
TDPIA	Taiwan Dyestuffs and Pigment Industrial Association
TEGEWA	German Association of producers of textile, paper, leather and fur auxiliaries and colourants, and other auxiliaries **Etc.**

On overview of our network (II)

National authorities

BAG	Swiss Federal Office for Public Health
BfR	German Federal Institute for Risk Assessment
BIS	Bureau of Indian Standards
BLV	Swiss Federal Food Safety and Veterinary Office
Danish EPA	Environmental Protection Agency
EPA	United States Environmental Protection Agency
Environment Canada	
Health Canada	
JRC	Joint Research Center - European Commission
KemI	Swedish Chemical Agency
METI	Japanese Ministry of Economy, Trade and Industry
UBA	German Federal Institute for the Environment
UNEP	United Nation Environment Programme

Etc.

On overview of our network (III)

Standard issuers

ISO	International Organization for Standardization
CEN	European Committee for Standardization
SNV	Swiss Association for Standardization
GOTS	Global Organic Textile Standard
ZDHC	Zero Discharge of Hazardous Chemicals Group
SAC	Sustainable Apparel Coalition

Bluesign

EU Ecolabel

C&A

H&M

Levi Strauss

Migros

Triumph

Unilever

Etc.

The first steps of heavy metals control in dyes

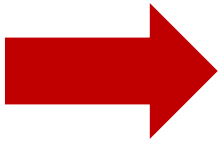
- In the 70's the only reference was the legislation on emissions in water

- In 1978 ETAD introduced recommended limits for dyes based on the legal limits for emissions, which are still valid (only Cr(VI) was added recently)

(In 2015 ETAD made the heavy metal limits for dyes mandatory for all its member companies)

ETAD heavy metal limits for dyes

Antimony	50
Arsenic	50
Cadmium	20
Chromium	100
Chromium (VI)	10
Lead	100
Mercury	4
Zinc	1500
Copper	250
Nickel	200
Tin	250
Barium	100
Cobalt	500
Iron	2500
Manganese	1000
Selenium	20
Silver	100



Notes

1. All values are in mg/kg (ppm).

2. These limits do not apply to products containing a listed metal as an inherent part of the molecular structure, e.g. metal-complex dyes or the double salts of certain cationic dyes. In this case the dyes user will use the information on the metal content to organize proper disposal.

Current regulatory status

- Regulations on heavy metals in the textile value chain still focuses on two aspects:
  - extractable metals in textiles
  - wastewater content

- However, ETAD's limits for dyes have been used since their creation as unofficial reference ; the ones for pigments have also been incorporated in legal texts (e.g. , Res. AP 89(I))

Standards: the unofficial regulators

- Currently the number of standards dyes manufacturers are asked by their customers to comply with are overwhelming

- Big companies may routinely check their products against up to 250 different standards

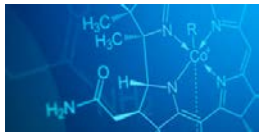
- As regards heavy metals, however, most standards only used to require limited metal content in the final product

- GOTS, e.g., was one of the first to introduce requirements for dyes, referring to the ETAD's limits

ZDHC: the check of all chemicals as common practice

- The Zero Discharge of Hazardous Substances group began in 2011 as a cooperation of big retailers /brands

- ETAD has collaborated with the group since their beginnings; our main contribution was to the creation of a Manufacturer Restricted Substance List (MRSL)



- The MRSL adds to the "classical check points" in current practice (textiles and wastewaters) a specific chemical profile for chemicals as additional requirement. Heavy metals in dyes refer to ETAD limits

Current trends and new issues

- Focus on Cr(VI)

- Introduction of different retailer/brand specific MRSLs with dye-related heavy metal limits

- New wastewater limits from standards

Focus on Cr(VI)

- A specific limit value for Cr(VI) is now becoming part of all standards; previously total Cr as Cr(III) +(Cr(VI) was accepted

- Due to the Cr(III)/Cr(VI) equilibrium depending on the analytical conditions, the metal needs a tailored method

A common reference would be quite useful in order to have harmonization

- ETAD is currently developing a suitable method, which we hope to propose as such a reference in the near future

Introduction of different retailer/brand specific MRSLs with dye-related heavy metal limits

- Some brands/retailers (also inside the ZDHC group) have started creating own MRSLs with different (usually lower) limits for heavy metals

- Some other standards have been “inspired” by GreenPeace’s Detox campaign and will even ask for purity at the level of the detection limits of the corresponding detection methods

- In general, the differences in the limits have no scientific relevance for product safety. They only bring about additional work for everybody

New wastewater limits from standards

- More restrictive requirements for wastewaters are coming up, e.g., the provisional/progressive/aspirational limits of ZDHC or the “Detox to zero” standard of Oekotex

- Dyes manufacturers have already been asked to guarantee that their products will assure compliance with such ambitious wastewater standards

- Some customers are also not clear about the status of complex-metal dyes and think they cannot use them any longer

Some good old common sense

- Some of the already requested wastewaters limits are below the allowed content in drinking water. Does is still make sense?

- Metals are naturally occurring substances; a phase out is simply impossible!

- Every member of the value chain is legally responsible for their production step, since only they know in detail their own specific processes, treatments and plants

- Communication in the value chain is a key asset: product stewardship programs und trusted suppliers can help you understand which products will better fit your needs

- You Get What You Pay For

Conclusions

- The control of heavy metals has a long history but is, again, a quite hot topic

- The focus on colorants is becoming stronger

- Dyes manufacturers are confronted with increasing demands, not all of which can be easily (or at all) fulfilled

- Both clear communication and collaboration from all involved parties are needed to allow a working value chain

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THANK YOU ALL

FOR

YOUR KIND ATTENTION!