Quinoline

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Inhalt

1. Introduction [1, 2]

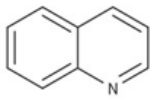
Quinoline is a naturally occurring substance that is found in coal tar and is detected in tobacco smoke, emissions from petroleum refining, coal and shale oil processing, and wood preservation. In accordance with the European CLP Regulation quinoline is classified as a potential carcinogen and if present in a chemical product above 1000 ppm, such product requires labeling H350 (“may cause cancer”) under the Global Harmonized System (GHS). Disperse and vat dyes can contain quinoline in excess amounts as a contaminant of a dispersing agent.

2. Identification [3]

CAS number:	91-22-5
Trade names:	quinoline

3. Molecular formula [3]

C9H7N



4. Physical and chemical properties [4]

State of aggregation:	liquid
Color:	light brown
Odour:	disagreeable
Solubility:	slightly soluble in water
Volatility:	low or very low

5. Industrial application and sources of quinoline in dyes [5, 6]

Quinoline is mainly used as an intermediate for manufacture of other chemicals. The industrial application related to textiles is the manufacture of dyes derived from quinoline.
Quinoline can also appear as a contaminant in dispersing agents. In order to aid the dyeing process disperse and vat dyes are formulated with dispersing agents (between 40% and 70% of dispersing agent can be added). Naphthalenesulfonate formaldehyde condensates are a commonly used class of dispersing agents. These condensates are manufactured from naphthalene and naphthalene is processed from coal tar. A minor by-product in the processing of naphthalene is quinoline and it is possible that low grade naphthalene is contaminated with small amounts of quinoline. This can carry through the manufacturing of the naphthalenesulfonate formaldehyde condensate dispersing agents.

6. Classification [3, 4]

Carcinogenicity:	Cat. 1B; H350
Mutagenicity:	Cat. 2; H341
Acute toxicity:	Cat. 4, oral; H302
Acute toxicity:	Cat. 4, dermal; H312
Skin irritation:	Cat. 2; H315
Eye irritation:	Cat. 2; H319
Aquatic chronic:	Cat. 2; H411

Signal Word: "Danger"

Hazard Statements (H-phrases)

- H302: Harmful if swallowed
- H312: harmful in contact with skin
- H315: Causes skin irritation
- H319: Causes serious eye irritation

- H341: Suspected of causing genetic effects
- H350: May cause cancer
- H411: Toxic to aquatic life with long lasting effects

Precautionary Statements (P-phrases)

P201: Obtain special instructions before use
P273: Avoid release to the environment
P280: Wear protective gloves/protective clothing
P301+P310: If swallowed: immediately call a poison center or doctor/physician
P305+P351+P338: If in eyes: rinse cautiously with water for several minutes- remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313: If exposed or concerned: get medical advice/attention.

7. Regulations

No legal textile limit exists yet for quinoline. However, in scope of the work on the draft regulation for restricting CMR 1A and 1B substances in textile articles European Commission proposed to restrict quinoline in textiles at the level of 1 mg/kg.

8. Conclusions [7]

Quinoline is a toxic chemical – a classified likely carcinogen and environmental contaminant. It can end up in a wastewater path as a result of dyes and intermediates production. Quinoline can be present especially in disperse and vat dyes as a contaminant in low quality dispersing agents of naphthalene formaldehyde condensate type.
As of July 01, 2017 a usage ban for intentional use of quinoline in manufacturing of articles will be defined in the bluesign® system substances list (BSSL), with allowed residual amounts from non-intended sources of up to 20 mg/kg.
Mixtures containing more than 1000 ppm quinoline cannot be registered in the bluesign® bluefinder.

9. Remarks

Data reported in this fact sheet are carefully selected but not exhaustive. The conclusion in this fact sheet is based on the current knowledge of bluesign technologies.

10. Literature

[1] US EPA (2001). Quinoline Integrated Risk Information System. Available at: https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1004tr.pdf

[2] EU CLP Regulation. Annex VI of Regulation (EC) No 1272/2008.

[3] http://echa.europa.eu/ (Accessed: 02.05.2017)

[4] http://gestis-en.itrust.de/ (Accessed: 02.05.2017)

[5] Luongo G., Thorsen G., Östman C.. Quinolines in clothing textiles – a source of human exposure and wastewater pollution?. Analytical and Bioanalytical Chemistry, February 2014.

[6] https://ecolorworld.com/quinoline/ (Accessed: 02.05.2017)

[7] bluesign® system substances list (BSSL) Consumer safety limits (effective version)