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Substance Risk Evaluation for Determining Environmental Emergency Planning under the *Environmental Emergency Regulations* Set under the *Canadian Environmental Protection Act, 1999* (CEPA 1999)

Sulphuric acid, cobalt(2+) salt (1:1)
(CAS No. 10124-43-3)

Risk Evaluation Conclusion:

- Threshold quantity of 0.22 tonnes (minimum concentration 1%) due to carcinogenicity
- Is a candidate for the *Environmental Emergency Regulations*

1.0 INTRODUCTION

The *Environmental Emergency Regulations*, developed under Part 8 of the CEPA 1999 (Government of Canada, 2011b), establishes a list of substances for which fixed facilities must notify Environment Canada that they store or use the substance on-site, by providing notices to Environment Canada, reporting when the substance is released into the environment, and developing an environmental emergency plan (E2 plan) for each substance stored or used at a fixed facility at or above specified threshold quantities.

To determine if a substance is a candidate to be added to the *Environmental Emergency Regulations*, Environment Canada developed a risk evaluation methodology based on the following hazard categories:

- Physical: flammable and combustible or oxidizing substances, or those having a potential to cause vapour cloud explosions or pool fires.
- Human Health: substances that are toxic by inhalation, are carcinogenic, or are corrosive.
- Environmental Health: substances that are: corrosive, persistent, bioaccumulative, or aquatically toxic.

For more information on the methodology for setting threshold quantities in the *Environmental Emergency Regulations*, please refer to Environment Canada (2015).

Sulphuric acid, cobalt(2+) salt (1:1) (CAS No. 10124-43-3) was selected for risk evaluation because it is a substance (under the Government of Canada's Chemicals Management Plan [<http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=8E18277B-1>]) that, if spilled, could be immediately harmful to humans and/or the environment.

Following the risk evaluation, Environment Canada recommends that this substance be proposed for addition to Schedule 1 of the *Environmental Emergency Regulations* at a threshold quantity of 0.22 tonnes with a minimum concentration of 1%.

2.0 SUMMARY OF THE RISK EVALUATION

2.1 Physical Hazard: Flammable, Combustible or Oxidizing Substances

Because sulphuric acid, cobalt(2+) salt (1:1) does not have an identified flash point (no flash point data were available during the data gathering process), and decomposes before reaching the boiling point of 735°C (Government of Canada, 2011a), this substance does not have the possibility of a vapour cloud explosion.

Therefore, no threshold is set for this substance as a result of its potential for flammability or combustibility.

2.2 Physical Hazard: Potential for Pool Fires

Environment Canada determined, via the Process Hazard Analysis Software Tools (PHAST) software, that sulphuric acid, cobalt(2+) salt (1:1) is not capable of causing a pool fire.

2.3 Human Health Hazard: Inhalation Toxicity

Because sulphuric acid, cobalt(2+) salt (1:1) does not have a vapour pressure greater than 10 mmHg (1.33 kPa) at 25°C (Government of Canada, 2011a), the substance does not have sufficient volatility to constitute an inhalation danger.

Therefore, no threshold is set for the inhalation toxicity to humans.

2.4 Human Health Hazard: Carcinogenicity

Because sulphuric acid, cobalt(2+) salt (1:1) is classified in Group 2B (possibly carcinogenic) of the International Agency for Research on Cancer (IARC, 1997), and because the substance is considered to be indefinitely persistent (Government of Canada, 2011a), a threshold of 0.22 tonnes is set for the carcinogenicity of this substance.

2.5 Human and Environmental Health Hazard: Corrosive Substances

The measured pH is greater than 2 and less than 11.5, therefore the substance is not considered corrosive and there is no associated threshold with this category.

2.6 Environmental Health Hazard: Persistent, Bioaccumulative, or Aquatically Toxic

Lethal concentration

No data were available during the data-gathering process.

Persistence

Environment Canada determined that sulphuric acid, cobalt(2+) salt (1:1) is indefinitely persistent in water according to our risk evaluation methodology (Environment Canada, 2015).

Bioaccumulation

Environment Canada determined that sulphuric acid, cobalt(2+) salt (1:1) is practically non-bioaccumulative according to our risk evaluation methodology (Environment Canada, 2015).

Threshold

Considering that no data have been gathered for the acute aquatic toxicity, and no modeled data are available for sulphuric acid, cobalt(2+) salt (1:1), therefore, no threshold is set for the environmental risk.

2.7 Assigned Concentration

Sulphuric acid, cobalt(2+) salt (1:1) is subject to the *Environmental Emergency Regulations* for aquatic toxicity. The minimum concentration assigned in the category for carcinogenicity is either 10% (not a carcinogen) or 1% (a carcinogen). Since sulphuric acid, cobalt(2+) salt (1:1) is classified as IARC (Group 2B), then the minimum concentration set for sulphuric acid, cobalt(2+) salt (1:1) is 1% (Environment Canada, 2015).

2.8 Assigned Threshold

Following the risk evaluation methodology developed under section 200 of CEPA 1999, the categories (flammability, combustibility, oxidizers, inhalation toxicity, aquatic toxicity, carcinogenicity, corrosiveness, pool fires) having the lowest scientific threshold will be compared against other risk management considerations. For example, the threshold will be compared to other provincial and federal legislation or voluntary programs that may already provide adequate management of the risk from an environmental emergency. Proposed thresholds may also be modified based on policy and other considerations as assessed during the public consultation period. For more information regarding the determination of thresholds, please refer to the *Implementation Guidelines for the Environmental Emergency Regulations 2011*

(Environment Canada, 2011).

Other Considerations

At this time, there are no other considerations to take into account for this substance that would result in an increase or a decrease in the calculated threshold quantity.

Findings

A proposed threshold of 0.22 tonnes with a minimum concentration of 1% is assigned for sulphuric acid, cobalt(2+) salt (1:1) based on its assessed carcinogenicity and for the fact the substance is indefinitely persistent. The threshold quantity and its respective concentration will not be finalized until after public consultation.

3.0 CONCLUSION

Information concerning the quantities of sulphuric acid, cobalt(2+) salt (1:1) (CAS No. 10124-43-3) in use in Canada indicates that the substance exists in commerce. Following the risk evaluation and policy considerations of sulphuric acid, cobalt(2+) salt (1:1) and taking into consideration the quantities in use in Canada, Environment Canada recommends that this substance be proposed for addition to Schedule 1 of the *Environmental Emergency Regulations* under CEPA 1999 at a threshold quantity of 0.22 tonnes at a minimum concentration of 1%.

Even if the quantity of a substance in use is below the threshold quantity indicated in the *Environmental Emergency Regulations*, Environment Canada recommends that emergency planning be applied to this substance in order to minimize, or prevent, any impacts on humans or the environment in the event of a release of the substance.

4.0 REFERENCES

Environment Canada. 2011. Implementation Guidelines for the Environmental Emergency Regulations 2011. Available from: <http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=1FB6D405-1>

Environment Canada. 2015. Summary of Risk Evaluation Framework for Determining Quantity Thresholds and Concentrations for Substances under the Environmental Emergency Regulations Set under the Canadian Environmental Protection Act, 1999 (CEPA 1999). Environment Canada. Available from: <https://www.ec.gc.ca/ee-ue/B2B4A2B2-D46D-460F-BCD9-C742A0F79191/ue-summary-ref-en.pdf>

Government of Canada. 2011a. Environment Canada, Health Canada. Final Screening Assessment for Cobalt disulphate (CAS RN 10124-43-3). Available from: <http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=8E18277B-1>

Government of Canada. 2011b. Environmental Emergency Regulations, Canadian Environmental Protection Act, 1999. Environment Canada. Registered on December 8, 2011. Available from: <http://www.gazette.gc.ca/rp-pr/p2/2011/2011-12-21/html/sor-dors294-eng.html>

IARC (International Agency for Research on Cancer). 1997. Volume 52. Chlorinated Drinking-water; Chlorination By-products; Some Other Halogenated Compounds; Cobalt and Cobalt Compounds. IARC Monographs Database on Cancer Risks to Humans. International Agency for Research on Cancer, World Health Organization. Available from: <http://monographs.iarc.fr/ENG/Monographs/vol52/>

5.0 FURTHER READING

Ketcheson K, Shrives J. 2010. Comparison of Threshold Quantities for Substances with Final AEGL-2 and IDLH Values under CEPA's Environmental Emergency Regulations. In: Proceedings of the Thirty-third Arctic and Marine Oilspill Program Technical Seminar on Environmental Contamination and Response. Environment Canada: Ottawa (ON). pp. 843-861.

U.S. EPA (U.S. Environmental Protection Agency). 1994. List of Regulated Toxic and Flammable Substances and Thresholds for Accidental Release Prevention. Federal Register, 59(20). Document Number 94-1556. 31. Washington (DC). Available from: <http://www.epa.gov/sites/production/files/2013-11/documents/appendix-a-final.pdf>