UNITED NATIONS

UNEP

UNEP/MC/COP.6/6/Add.2

MINAMATA CONVENTION ON MERCURY

Distr.: General
28 July 2025

Original: English

Conference of the Parties to the Minamata Convention on Mercury
Sixth meeting
Geneva, 3–7 November 2025
Item 4 (b) (iii) of the provisional agenda*

Matters for consideration or action by the Conference of the Parties: mercury-added products and manufacturing processes in which mercury or mercury compounds are used: consideration of the feasibility of mercury-free alternatives for manufacturing vinyl chloride monomer

Consideration of the feasibility of mercury-free alternatives for manufacturing vinyl chloride monomer

Note by the secretariat

I. Introduction

1. The present note contains a report on the technical and economic feasibility of mercury-free catalysts in vinyl chloride monomer production pursuant to decision MC-5/6.

II. Intersessional work pursuant to decision MC-5/6

2. Pursuant to paragraph 3 of article 5 of the Minamata Convention on Mercury, each party is to take measures to restrict the use of mercury or mercury compounds in the processes listed in part II of annex B to the Convention in accordance with the provisions set out therein. Part II of annex B provides that parties are not to allow the use of mercury in vinyl chloride monomer production five years after the Conference of the Parties has established that mercury-free catalysts based on existing processes have become technically and economically feasible.

3. The Conference of the Parties, in decision MC-5/6, invited parties and relevant organizations to submit, on a voluntary basis, information to the secretariat on technically and economically feasible alternatives to the use of mercury and mercury compounds in vinyl chloride monomer production, in accordance with paragraph 8 of article 5 and paragraph 1 of article 17 of the Convention, and requested the secretariat to prepare, subject to the availability of resources, a report for consideration by the Conference of the Parties at its sixth meeting.

4. Information was submitted by nine parties and three organizations.[1] The information received has been posted on the Convention website and compiled in document UNEP/MC/COP.6/INF/9.

* UNEP/MC/COP.6/1/Rev.1.

[1] Brazil, Burkina Faso, China, Mozambique, Norway, Senegal, Switzerland, Uganda and the United States of America, as well as the Natural Resources Defense Council, the United Nations Industrial Development Organization and the Zero Mercury Working Group.

5. The following paragraphs constitute the secretariat's report, which draws on the information submitted in response to the above-mentioned invitation and on information submitted by parties as part of their national reports pursuant to article 21.

6. Brazil and Norway indicated that vinyl chloride monomer was manufactured in those countries using ethylene-based methods in which mercury compounds were not used. Brazil, Norway, the United States of America and two organizations observed that ethylene-based methods not involving the use of mercury compounds were available and feasible.

7. China reported on the use of mercury chloride as a catalyst in acetylene-based vinyl chloride monomer production and on the measures taken to reduce such use, including the activities carried out under the project entitled "Demonstration of mercury reduction and minimization in the production of vinyl chloride monomer in China", implemented by the United Nations Industrial Development Organization (UNIDO) from 2018 to 2025 and funded by the Global Environment Facility.

8. The national reports pursuant to article 21 of the Convention indicate that mercury compounds are used in one acetylene-based vinyl chloride monomer production facility in India. Although India did not submit information during the current intersessional period, in its 2023 national report, the country reported a reduction of mercury use in that manufacturing process.

9. In the submissions, different views were expressed regarding the technical and economic feasibility of mercury-free catalysts in acetylene-based processes.

10. China provided information about its research and development work on mercury-free catalysts, including its evaluation of gold-, copper- and ruthenium-based catalysts and the demonstration of large-scale production by three enterprises. China concluded that the industrial application of existing gold-based, copper-based and other mercury-free catalysts still faced problems and challenges, such as uncertainty in technical feasibility, lack of economic feasibility, and lack of clarity regarding the environmental risks of mercury-free alternatives.

11. Switzerland provided information about full-scale operations using gold- and copper-based catalysts and observed that mercury-free vinyl chloride monomer production using such catalysts was already technically feasible and economically competitive. Uganda mentioned alternative catalysts based on gold, copper, palladium and other metals.

12. The United States observed in its submission that the use of alternatives to mercury and mercury compounds in global vinyl chloride monomer production was technically feasible on the basis of two key factors. The first factor was the availability of mercury-free ethylene-based production processes. The second was technological advancement in acetylene-based processes, which enabled the use of alternatives to mercury-based catalysts, including single metallic catalysts (gold, palladium, copper or other metals), ionic liquids, carbon-based catalysts, multi-metallic catalysts, and liquid-phase non-mercury catalysts using copper(I) chloride and copper(II) chloride. The United States added that gold-based catalysts for the acetylene hydrochlorination process offered a particularly viable mercury-free alternative, as it had been deployed in both pilot and commercial production facilities, including in China.

13. UNIDO submitted information on the project mentioned in paragraph 7 above, describing the preliminary results of demonstration runs with mercury-free catalysts, including some challenges to the technical and economic feasibility of gold- and copper-based catalysts.

14. The Natural Resources Defense Council and the Zero Mercury Working Group also observed that mercury-free catalysts for acetylene-based processes were in use and had been demonstrated to be technically and economically feasible on the basis of the information provided on the project mentioned in paragraph 7 above, as well as published news reports, scientific literature and technological information from the private sector.

15. In summary, the use of mercury compounds in vinyl chloride monomer production is limited to a few parties. While several submissions highlighted the technical and economic feasibility of mercury-free catalysts based on existing processes, others questioned such feasibility.

III. Proposed action

16. The Conference of the Parties may wish to consider the report by the secretariat on the technical and economic feasibility of mercury-free catalysts in vinyl chloride monomer production, which is based on information submitted by parties and relevant organizations as contained in document UNEP/MC/COP.6/INF/9, with a view to adopting a decision, as appropriate.