

Response for “Questionnaire for Further Clarification”

Exemption Request No. 2, “Lead in platinized platinum electrodes for measurement instruments”

Answers to the Questions

1. The application states that platinized platinum electrodes are the high performance electrode used in various applications. Though a general example is given concerning the analysis of water and effluents, the scope for which this application is in use remains vague, and yet the amount of lead that is estimated to reach the market through this application is minute, implying that it is not widely used.
 - a. Please provide information whether platinized platinum electrodes are used for other uses, besides in monitoring and analysis instruments (i.e. other RoHS annex 2 categories)?

To use platinized catalyzer for an electrode material of fuel cell or hydrogen storage metal has been studied. However, it is not yet for practical uses.

- b. Please specify applications that require the use of platinized platinum electrodes, i.e. applications in which lead free electrodes cannot be used. If this application is only used by category 9 products, please elaborate for what instruments.

Platinized platinum electrodes are appropriate for electrical conductivity measurements where the measurement range is extremely wide, or where the sample is strongly acidic or basic. As is shown in Table 1 platinized platinum electrode has much wider measuring range compared to other electrodes. Table 2 shows corrosion resistance of various electrode materials.

2. Please adapt the wording of the requested exemption to suit the scope for which the product is used.

Lead in platinized platinum electrodes for wide range conductivity measurements, or conductivity measurements in strong acidic or alkaline environment.

3. In the far past copper or lead were added to the plating solution to enhance platinum black precipitation and its adherence to the surface of the electrode, however it was found that lead acetate was more efficient for this purpose. Please elaborate on the chemical characteristics of lead in comparison with other elements so as to demonstrate why finding a substitute has not been possible.

Please find advantages to use lead acetate in the review article attached.

Feltham, A. M. and Spiro M., "Platinized Platinum Electrode", Chemical Reviews, 1971, Vol. 71No. 2, pp 177 – 193

4. You mention that platinized platinum electrodes are required to measure electrical conductivity on the basis of ISO/EN standard as accurate data cannot be obtained with other electrodes without influencing ecosystems as well as research and development.
 - a. Please state which ISO/EN standards refer to platinized platinum electrodes when measurements of conductivity are required and respectively if measurement methods implementing platinized platinum electrodes are the only authorized methods in these cases.

The standard is EN27888 1993 (ISO 7888: 1985) Water quality; determination of electrical conductivity. In this standard no electrodes other than the platinized platinum electrode are referred.

- b. Please explain how the ecosystem would be influenced if other electrodes were to be used.

For measurements of the electrical conductivity with wide variability of environmental water (for example, river water, lake water, reservoir water and industrial wastewater), electrodes which can be used for wide range are appropriate. If some electrodes with different measuring range are used, obtained results are not reliable because of some missing data. For the measurement of industrial wastewater, moreover, the high resistance against strong acid/alkaline is required. (See Table 3)

c. Please explain how R&D would be influenced if other electrodes were to be used.

For the R&D purposes also “wide range” and “high resistance against strong acid/alkaline) are required. For example, researchers should measure the electrical conductivity of unknown samples. In such a case, the above mentioned two characters are inevitable for electrodes. When the conductivity of the sample varies a lot, it is important to measure with one electrode in whole range in order to obtain reliable data.

d. Please emphasize why other substances cannot be used for plating the electrodes (elimination of the platinum black would eliminate the need for using lead).

Till now, no better alternative materials are found.

5. You estimate the amount of lead for this application, in products imported to the EU from Japan, to be less than 1 gram of lead per year. Please provide a detailed calculation as to how this number has been reached:

a. How much lead is present in a single product? How many products does Japan export to the EU market per year?

About 0.6mg of lead is contained per electrode at most. Last year around 1500 pieces of electrodes were exported from Japan.

b. What is the %weight of lead in the homogenous material of the application to which it is bound (i.e. in the platinum black)?

Although it depends on electrodes, the concentration of lead is (at most) 2% weight in the homogenous material of platinum black.

6. What is the share of products imported from Japan in the total market share of this product in the EU and respectfully, what is the estimation for the total amount of lead that reaches the EU market annually through the supply of platinized platinum electrodes?

We do not know.

7. Please specify what happens to this product at the “end of use”? How is the waste processed?

We inform users to treat the products at the end of use according to the national WEEE legislation.

8. Please state clearly if any efforts are being made to discover possible substitutes for the use of lead in this application (substitution) or for possible substitutes for platinized platinum electrodes (elimination). Please elaborate as to the status of such efforts and estimated timeframes where relevant.

(substitution)

Any relevant findings have not been made since the review referred in 3 was written. Various trials to reduce consistency of lead acetate has been done, however it has not reached the level under 1000ppm in the homogenous material.

(elimination)

Various kinds of electrodes have been tested. However, till now no electrodes are better for chemical resistance and wide variability of measuring range. Therefore, only the platinized platinum electrodes can be used under certain condition (see 4b and c).