25 September 2012

Dear DG Environment of European Commission,

The JBCE (Japan Business Council in Europe) would like to request granting exemptions as referred to in Article 5 of the "Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electric equipment".

Requested is the following item for categories 9:

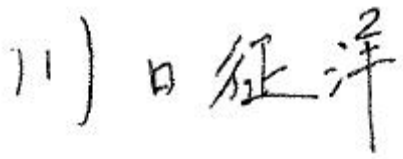
Lead in platinized platinum electrodes for measurement instruments

Current Annex IV includes the exemption for " 1a. Lead and cadmium in ion selective electrodes including glass of pH electrodes ". However, in this exemption non ion-selective electrodes are not included.

We would appreciate it if you could evaluate this application and understand about its importance.

Yours sincerely,

Yukihiro Kawaguchi



Secretary General
Japan Business Council in Europe

ABOUT JBCE

The Japan Business Council in Europe was established in 1999 as the representative organization of Japanese companies operating in the European Union. Our membership consists of more than 60 leading multinational corporations that are active across a wide range of sectors, including electronics, automotive, and chemical manufacturing. The key goal of JBCE is to contribute to EU public policy in a positive and constructive way. In doing this, we can draw upon the expertise and experience of our member companies.

JBCE - Japan Business Council in Europe Rue de la Loi 82 B-1040 Brussels
Tel:(02)286-5330 Fax:(02)230-5485 E-mail: info@jbce.org
URL: http://www.jbce.org/

2011/65/EU ANNEX V

Applications for granting, renewing and revoking exemptions as referred to in Article 5

Applications for exemptions, renewal of exemptions or, *mutatis mutandis*, for revoking an exemption may be submitted by a manufacturer, the authorised representative of a manufacturer, or any economic operator in the supply chain and shall include at least the following:

Criteria	Information
(a) the name, address and contact details of the applicant	Japan Business Council in Europe Rue de la Loi 82, B-1040 Brussels, Belgium TEL: (32)-2-286.53.30 Contact Person: (Mr) Akihito Nakai Email: nakai@jbce.org
(b) information on the material or component and the specific uses of the substance in the material and component for which an exemption, or its revocation, is requested and its particular characteristics	1. The component for which an exemption is requested: Lead in platinized platinum electrodes. Platinized platinum electrode is the platinum electrode covered with a thin layer of platinum black. Small part of lead is concentrated in the layer of platinum black during the electrodeposition process. Characteristics Platinum is used because it prevents chemical reaction in the solution. Performance of electrode as catalyst and its electric capacitance is proportional to its surface area. Platinum black electrodeposition is done to enlarge the surface area of metal electrodes, enabling the surface area of the electrodes to enlarge about 1,000 times of the flat electrodes without platinum black electrodeposition. Platinized platinum electrode is the high performance electrode in various applications. In electrochemistry, the standard potential of a chemical species is measured as voltage difference between the oxidation-reduction potential of hydrogen and the species using the standard hydrogen electrode because the oxidation-reduction potential of hydrogen is zero volts. The standard hydrogen electrode is a thin platinum plate with platinum black electrodeposition on its surface. The platinum functions as a catalyst to efficiently stimulate the oxidation-reduction reaction of hydrogen and platinized electrode is used to create lager surface area of the electrode so as to generate stable oxidation-reduction potential. The standard hydrogen electrode is one of the applications of the platinized platinum electrode for measurement.

Platinization method:

Platinization is conducted using the plating solution prepared from water solution of 30g/L of hydrogen hexachloroplatinate(IV) hexahydrate (CAS#:18497-13-7) and 0.25g/L of lead(II) acetate trihydrate (CAS#:6080-56-4). A suitable plating apparatus consists of a 6 V d.c. supply, a variable resistor, a milliammeter, and two electrodes. Good platinized coatings are obtained using from 1.5 to 3 C/cm^2 of electrode area. For example for an electrode having a total area (both sides) of 10 cm^2, the plating time at a current of 20 mA would be from 12.5 to 25 min. The current density may be from 1 to 4 mA/cm^2 of electrode area. Plate the electrodes one at a time with the aid of another electrode with alternating the D.C. current direction. During the plating, agitate the solution gently. This method is described in EN27888:1993 (ISO 7888:1985), "Water quality - Determination of electrical conductivity". This method provides good adherence of the platinum black to the substrate.

Total amount of the restricted substance (Pb):

According to the composition of the plating solution, small part of lead is contained in the platinum black on the electrode.

The amount of lead imported into EU from Japan in the platinized platinum electrodes for measurement instruments, which is prepared by the method with the plating solution of the composition described above, would be less than 1 gram per year.

2.
The equipment utilizing platinized platinum electrode

For example, electrical conductivity meters are used for inspecting and testing various kinds of water, such as water in rivers, seawater, distilled water, drinking water, industrial water, and industrial effluents. (Please refer to the attached picture of the electrodes.)

The structure and principle of electrical conductivity meters:

AC two electrode method.

The figure 3 illustrates AC two electrode method with two electrodes put into the solution, applying AC power forming stable voltage waves and measuring the value of electric current through the solution.

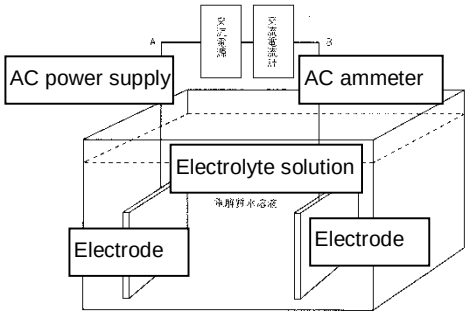


Figure 3 The principle of the AC two electrode method.

The measurement of electrical conductivity by the **AC two** electrode method causes the transfer of charge between an electron in the electrode and a ion in the solution on the surface of the electrode (electrode reaction). Here, equivalent circuit between electrode A and B becomes complex as described in figure 4.

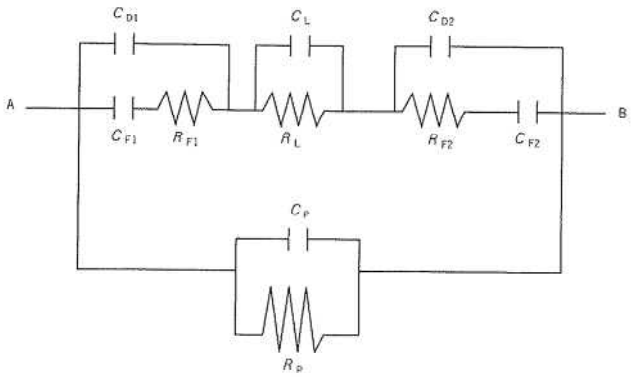


Figure 4 The equivalent circuit of AC two electrode method

The symbols denote as follows:

R_L; the electrical resistance between the electrodes to be measured,

C_L; the capacitance according to the permittivity of the solution created between electrodes,

C_{D1} and C_{D2}; the capacitance according to the

	electric double layers created on the surfaces of the electrodes, C_{F1}, $C_{F2,}$ R_{F1} and R_{F2}; the capacitances and electrical resistances according to the electrode reaction on the surfaces of the electrodes, C_P and R_P; the shunt capacitance and the electrical resistance connected to the electrodes with wire leads and others. If the measurement of the electrical resistance between electrodes is susceptible to the C_P capacitance, the effect can be reduced with covering the lead wires with shield. C_L is to be considered only if the solution is as highly resistant as an insulator. The impedance caused by electrode reaction and others needs to be sufficiently reduced in comparison with the electrical resistance between the electrodes R_L when the electric conductivity of the solution is measured. High frequency of the alternative voltage reduces the capacitive impedance. Although the equivalent circuit of the cell is complicated, the equivalent circuit of the Figure 4 can be simplified by use of electrodes with precious metal (Pt electrodes are often used) to prevent chemical reaction in the solution and platinum black electrodeposition with which the capacitances apart from C_{D1} and C_{D2} can be ignored. The capacitances of C_{D1} and C_{D2} are increased by use of platinum black electrodeposition and adequately high frequency of AC power, enabling highly accurate measurement of electric conductivity. As mentioned above, electric capacitance is generated on the surface of electrodes and in the liquid interface of reagents. The polarization impedance of electric double layers is equivalent to $1/(2\pi f C_{D1,2})$. The increase of the polarization impedance adds the electrical resistance of the reagent, resulting in measurement error. $2\pi f C_{D1,2}$ needs to be greater in order to measure it correctly. Here, $2\pi f=\omega$ (circular frequency) $C_{D1,2}$= electric capacity of the metal electrodes The capacity of the metal electrode $C_{D1,2}$ is proportional to the surface area. Platinum black electrodeposition is done to enlarge the surface area of metal electrodes, enabling the surface area of the electrodes to enlarge about 1,000 times of the flat electrodes without platinum black plating.

(c) verifiable and referenced justification for an exemption, or its revocation, in line with the conditions established in Article 5	Platinized platinum electrode is required in order to measure, for example, electrical conductivity on the basis of ISO/EN standard. Accurate data cannot be obtained without platinized platinum electrode, that would influences on ecosystems as well as research development.
(d) an analysis of possible alternative substances, materials or designs on a life-cycle basis, including, when available, information about independent research, peer-review studies and development activities by the applicant and an analysis of the availability of such alternatives	The elimination of lead in the plating solution has been studied by many electrochemists for several decades, and some reviews have been also issued[1)]. But platinized platinum electrode, at which lead(II) acetate is used as the component of the plating solution, is still required to measure the solutions with low electrical conductivity accurately. [1)]**PLATINIZED PLATINUM ELECTRODES** **A.** M. FELTHAM **AND** M. SPIRO ***Department of Chemistry, Imperial College of Science and Technology, London S. W. 7, England*** ***Received July 29, 1970 (Revised Manuscript Received October 23, 1970)*** *Alternative technologies:* Useful alternative technologies are not proposed today. *1) Other type of electrode:* *Platinized platinum electrode shows superb characteristics especially in low electric conductivity and low dissolved hydrogen area.* *2) Other method of platinum black electrodeposition:* *Electrodeposition using lead acetate is superb in resulting surface area and adherence of platinum black to the substrate platinum as shown in the reference 1).*
(e) information on the possible preparation for reuse or recycling of materials from waste EEE, and on the provisions relating to the appropriate treatment of waste according to Annex II to Directive 2002/96/EC	None
(f) other relevant information	None

(g) the proposed actions to develop, request the development and/or to apply possible alternatives including a timetable for such actions by the applicant	Please refer to the above “(c)” partly.
(h) where appropriate, an indication of the information which should be regarded as proprietary accompanied by verifiable justification	None
(i) when applying for an exemption, proposal for a precise and clear wording for the exemption	Lead in platinized platinum electrodes for measurement instruments.
(j) a summary of the application	This application aims to add the following item to the Annex IV of RoHS directive (2011/65/EU). “Lead in platinized platinum electrodes for measurement instruments”

JBCE - Japan Business Council in Europe Rue de la Loi 82 B-1040 Brussels
Tel:(02)286-5330 Fax:(02)230-5485 E-mail: info@jbce.org
URL: http://www.jbce.org/