Mercury Disk Ultramicroelectrode Based on the Controlled-Growth Mercury Drop System**

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A mercury disk ultramicroelectrode (MDUE) can be obtained using a controlled-growth mercury drop electrode (CGMDE) equipped with a very narrow-bore capillary (internal diameter <100 µm). After dispensing mercury drop and then knocking it off, a slightly convex mercury disk is formed at the opening of the capillary, recessed by approximately 5 µm with respect to the capillary edge. The advantages of MDUE are: easily renewable surface and no interference by the support material. However, due to the free diffusion of the metals in Hg inside the capillary, it is not possible to accumulate the electrode reaction product, therefore anodic stripping experiments cannot be carried out. In the case of electrode processes involving soluble products, MDUE is superior to mercury film microelectrodes. Also, the recession of the mercury inside the capillary causes, at short times, some deviations of the voltammetric and chronoamperometric characteristics from the inlaid disk model. The voltammetric characterization of the mercury disk ultramicroelectrode was carried out using the model systems: Cd²⁺/Cd(Hg), Tl⁺/Tl(Hg) and [Ru(NH₃)₆]³⁺/[Ru(NH₃)₆]²⁺. The results show, that the reproducibility of the voltammetric data is excellent; the relative standard deviation of the maximum current was 2.25%. Therefore, the MDUE can be used instead of mercury film ultramicroelectrode in all experiments that do not require the accumulation of traces of metals in mercury.

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