occur under similar experimental conditions by monitoring the O_2 concentration in a closed vessel. In identical experiments but using TiO_2 samples loaded with 3% $RuO_2 \cdot xH_2O$ the dark potential was ca. 280 mV and this moved slowly (over 20 min or so) to ca. 230 mV upon illumination. Perhaps this reflects the trapping of positive holes by RuO_2 islands but further work is required before this finding can be satisfactorily explained.

In conclusion, it has been shown that surface loading of small particles may introduce changes in the behavior of the whole particle whenever the ratio of surface to volume is large. The first direct observation of ruthenium dioxide islands prepared via a low-temperature method has been reported. Although the uniformity of the dispersion is low, the catalyst produced is kinetically fast in O_2 evolution. A possible model for a TiO_2–RuO_2 microelectrode would be represented by a bubble of TiO_2 loaded with deposits of RuO_2. The whole surface of TiO_2 is then available for charge injection from oxidants in the electrolyte solution but the charges can only go out of the particle at the RuO_2 islands on its surface. In summary, the catalyst structure has to create adequate conditions for the micro–macro transport process extending beyond the atomic level before efficient O_2 evolution can occur.

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Registry No. RuO_2, 12036-10-1; TiO_2, 13463-67-7; H_2O, 7732-18-5; $RuCl_3$, 10049-08-8.

COMMENTS

Vibrational Numbering of Bands in the Spectra of Polyatomic Molecules

Sir: In discussions of the vibrational assignments of bands of polyatomic molecules, extensive use has been made of the nomenclature introduced by Brand, Callomon, and Watson,[1] e.g., $2_0^2 4_0^1$, $6_0^1 16_1^1$. The principal numbers refer to the vibrations excited and the superscripts and subscripts refer to the number of quanta involved in the upper and lower states, respectively. No confusion has arisen when these symbols are written but there has been some confusion when these symbols are spoken. This unfortunate situation may have been caused by the need in some journals to stagger the superscripts and subscripts.

We *strongly recommend* that, when spoken, the superscript should precede the subscript in conformity with the recognized convention in molecular spectroscopy that the upper state precedes the lower state.[2,3] We also recommend that, when staggering is necessary in print, the same order be followed, e.g., 4^1_0. Reading from left to right, the assignment is then read as four-one-zero, in conformity with standard spectroscopic usage for molecules.

(1) Private communication by J. C. D. Brand, J. H. Callomon, and J. K. G. Watson circulated to participants at the 35th Discussion of the Faraday Society on "The Structure of Electronically Excited Species in the Gas-Phase", held at Queen's College, University of St. Andrews, Dundee, Scotland on April 2–3, 1963. The notation first appeared in the Ph.D. thesis of J. K. G. Watson, University of Glasgow, Scotland, 1962 and in the paper by J. H. Callomon and K. K. Innes, *J. Mol. Spectrosc.*, 10, 166–81 (1963).

(2) G. Herzberg, "Molecular Spectra and Molecular Structure", Van Nostrand, Princeton, NJ: Vol. I, 1950; Vol. II, 1945; Vol. III, 1967.

(3) R. S. Mulliken, *J. Chem. Phys.*, 23, 1997–2011 (1955).

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