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DETERMINATION OF SURFACE CHARGE FOR METAL OXIDES

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Abstact

The behavior of aqueous dispersion of inorganic oxides is of great importance in industrial and laboratory applications. Point of zero charge is of fundamental importance in surface sciences; for example, in the field of environmental science, it determines how easily a solid substrate is able to adsorb potentially ions. It also has applications in colloids science, e.g., flotation of minerals. Point of zero charge (pH_{PZC}) for a given oxide surface is the pH value at which it surface has a net neutral charge. The significance of the pH_{PZC} value is that a given oxide surface will have a positive charge in the acid pH domain (and the value is less than the point of zero charge) and a negative charge in the alkaline pH domain.

The point of zero charge (pH_{PZC}) for titanium dioxide reported in the literature cover almost all pH domain, from 2 to almost 9. In this paper, we used the acid-base titration method to determined the pH_{PZC} for a TiO_2 sample. Results obtained for three different electrolite solutions show that value of point of zero charge is 5.5, in a very good correlation with the data from the literature.

Keywords: point of zero charge, titanium dioxide, acid-base titration method

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