

Preparation of TiO_2 -coated Hollow Glass Beads and Their Application to the Control of Algal Growth in Eutrophic Water

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Photocatalytic inactivation of algae, Anabaena, Microcystis, and Melosira, was carried out with the TiO_2 -coated pyrex hollow glass beads under the illumination of UV-A light. After being irradiated with UV-A light in the presence of the TiO_2 -coated pyrex glass beads, Anabaena and Microcystis, known as typical cyanobacteria, lost their photosynthetic activity, and the string of Anabaena cells and the colonies of Microcystis cells were completely separated into individual spherical one. In the case of Melosira which is a typical diatom, however, somewhat lower photocatalytic inactivation efficiency was obtained, which was believed to be due to the presence of the inorganic siliceous wall surrounding the cells of Melosira. The TiO_2 -coated hollow glass beads could successfully be employed for the practical application at the eutrophicated river under sunlight. More than 50 % of the chlorophyll-a concentration could be reduced by the action of TiO_2 photocatalysis.