A Miniscale Algal Toxicity Test

A simple miniscale (approx. 1 - 2.5 ml) toxicity test procedure with the freshwater green alga Selenastrum capricornutum is described. The procedure fulfils the validity criteria of the ISO (International Association for Standardization) standard test protocol. Practically identical concentration-response curves were obtained with the ISO standard test and the minitest for potassium dichromate and 3,5-dichlorophenol. The minitest is conveniently carried out using 2.5 ml test volume in 20 ml glass scintillation vials, placed on a microplate shaker or on an ordinary shaking table, but smaller containers and test volumes (down to 1 ml) could also be used. Tissue culture treated polystyrene microplates were found toxic to algae and thus unusable. pH control is achieved more easily in the minitest than in larger size shake flasks due to greater turbulence and a larger surface/volume ratio which both facilitates CO₂ mass transfer. Uniform illumination of the individual units of a minitest setup is obtained readily due to the small area that has to be illuminated. Using the rapidly growing green alga S. capricornutum as test organism, it is proposed generally to reduce the standard test duration from 3 days to 2 days (minitest as well as larger volume tests) in order to avoid excessive biomass growth. Shortening tests to 2 days appears necessary if light intensity and temperature are near the upper limits of the intervals stated in the ISO standard.
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