Turkish Journal of Chemistry

Turkish Journal

of

Chemistry

Determination of H_2O_2 Content of Various Water Samples Using a Chemiluminescence Technique

Tuğba TÜĞSÜZ, Elmas GÖK, Serdar ATEŞ
Hacettepe University, Chemistry Department, Beytepe 06532 Ankara-TURKEY

Abstract: Hydrogen peroxide (H_2O_2) plays an important role in natural water samples. In this study H_2O_2 concentrations were quantified in different water samples by chemiluminescence detection. This method was chosen because of its high sensitivity and suitability for determining low concentrations of H_2O_2. H_2O_2 is introduced to the oxidation reaction of alkaline luminol solutions in the presence of Co^{2+} ion catalyst. When these components are mixed, blue light (● = 440 nm) is emitted. Maximum chemiluminescence intensity occurs within 2 s after mixing and is continuous for up to a few minutes, permitting accurate measurements at selected delay times. H_2O_2 concentrations being very low in water samples made us use the standard addition method. Thus the sample luminescences were measured by the addition of 25 μ L 0.075 M H_2O_2 standard solutions. The H_2O_2 content of water samples was between 0.13 mM (in snow water) and 1.51 mM (in Gölbaşı Lake water). The results indicated that H_2O_2 concentrations in surface waters are representative of aquatic life.

Keywords
Authors

chem@tubitak.gov.tr

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Turk. J. Chem., **27**, (2003), 41-48.
Full text: pdf
Other articles published in the same issue: Turk. J. Chem.,vol.27,iss.1.