A new iodometric microwave assisted method for peroxide determination

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Peroxides play an important atmospheric role both in gas and particle phases [1]. Hydroperoxides can be secondary photochemical products playing a role as precursors of odd-oxygen as well as reservoirs of odd-hydrogen radicals [2]. Several techniques are available in the literature to measure peroxides in Secondary Organic Aerosols (SOA), although current techniques are very expensive or time consuming. In the present work, a new fast and sensitive iodometric spectrophotometric method has been developed based on the traditional iodometric method [3-4]. The proposed method is based on the acceleration by microwave radiation of the reaction of peroxides with potassium iodide in acid medium to liberate iodine, that in presence of excess of iodide forms triiodide that could be monitored at three different wavelengths (287, 351 and 420 nm).

Different analytical parameters including pH, potassium iodide mass, temperature and time of thermostatic bath, microwave power and time, interferences due to metals and oxygen were evaluated. The method has been optimized for H_2O_2 and *t*-butyl hydroperoxide (one of the peroxides thar reacts very slowly in the traditional method), in contrast with previous studies that only used H_2O_2 or an organic peroxide that reacts faster with iodide.

The main advantages of this new method in relation with the traditional method are the following: less time-consuming analysis, lower and controller oxygen interferences and smaller sensitive differences between different peroxides.

This new method could be applied not only to measure peroxides in SOA, that would allow to improve our knowledge of these compounds in its role as reservoirs of odd-hydrogen radicals, but it can be used as well in kinetic studies in aqueous phase.

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