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EFFECT OF IMPURITY CONTENT
ON STRUCTURE OF LIVING WATER

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In order to study the influence of impurities content on the water structure, Raman spectra and degrees of depolarization of different living water are measured by Raman spectroscopy, the relationship between the depolarization ratio and the impurity content in drinking water was obtained by the utilisation of computer deconvolution for the stretching vibration peak. The results showed that the intensity of different bending vibration is almost the same, and the intensity of the stretching vibration reflects different content of impurities in water. Depolarization calculation of water molecules showed that the   stretching vibration   is stronger than the bending vibration. The interaction of impurity ions and water molecules enhances the vibration rate of water molecules, making the symmetry of stretching vibration reduced, and leading to increased depolarization ratio. Therefore, the impurities content can be determined from the relative intensity of Raman characteristic peaks and the degrees of depolarization.

Keywords: Raman spectroscopy, water structure, impurity content, depolarization ratio.

Introduction

Many unique properties of water have relationships with micro-structure of water.   Water molecular association with different size formed by hydrogen bonds between water molecules [1, 2]. The association degree of water molecular is not only influenced by temperature, but also by other substances dissolved in water such as various ions and other factors [3]. Raman spectroscopy is

interaction of ionic impurities in water with water molecules enhances the vibration rate of water molecules, making the symmetry of the stretching vibration of water molecules reduces, thereby leading to the increase of their depolarization degree.

Therefore, based on the relative intensity of Raman characteristic peaks and the depolarization ratio under the terms of the same characteristic peaks, the relative impurities content in living water can been determined.

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