Dielectric Relaxation Study of Some Solutions Containing β-Cyclodextrin and Dimethylsulfoxide

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Dielectric spectra have been measured up to 72 GHz at 20°C for solutions of β-cyclodextrin (CD) in the following solvents over the whole solubility range of CD: dimethylsulfoxide (DMSO), DMSO/1,4-dioxane mixture (2:1 molar ratio), DMSO/water mixtures (2:1 and 1:2). The spectra are analyzed into a sum of Debye type spectral components. These are likely to be caused by different physical processes. The discussion shows (i) that there is a preferential CD-DMSO interaction, by far exceeding the CD-water interaction, and (ii) that, concerning CD-DMSO, a loose interaction can be distinguished from the formation of an inclusion complex.

Key words: Association; Dielectric Spectroscopy; Liquids.