Title:	Painkiller Isoxicam and Its Copper Complex Can Form Inclusion Complexes with Different Cyclodextrins: A Fluorescence, Fourier Transform Infrared Spectroscopy, and Nuclear Magnetic Resonance Study
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Abstract:	The interaction of a painkiller Isoxicam, belonging to the oxicam group of nonsteroidal anti-inflammatory drugs (NSAIDs) and its copper complex with different cyclodextrins (β-CD, γ-CD, HPβCD, and HPγCD), has been investigated in both solution and the solid state. Steady state and time-resolved fluorescence spectroscopy, fluorescence anisotropy, 1H NMR, and FTIR spectroscopy are used. Both the drug and its copper complex form a host–guest inclusion complex with all CDs. Fluorescence spectroscopy is used to determine binding constants and stoichiometries of the host–guest complex. The strongest binding is seen for γ-CD. 1H NMR study showed that Isoxicam penetrates into the CD cavity from the more accessible wider side. For β- and γ-CD, Isoxicam showed one type of binding, i.e., formation of an inclusion complex, whereas, for HPβCD and HPγCD, it showed two types of binding, i.e., inclusion in the CD cavities and interaction with the outer surface of the CD molecules mainly near the hydroxy propyl group. Deeper penetration occurred into the larger diameter cavity of γ-CD and HPγCD compared to β-CD and HPβCD. From FTIR and 1H NMR study, it is seen that predominantly the π-electron-rich benzene part of the drug and its complex penetrate into the host cavity.
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