

Abstract template:

Title

Nitric Acid-Water Interaction Probed via Isolation in Carbon Tetrachloride

Reference

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Abstract

The interaction between nitric acid and water is investigated under conditions of limited water activity: at the aqueous interface and dispersed in the hydrophobic solvent, carbon tetrachloride. It is found that water forms only monomers in carbon tetrachloride at temperatures >0 °C. Addition of nitric acid shows features due to molecular nitric acid and the hydrates: nitric acid monohydrate (NAM), nitric acid dihydrate (NAD), and nitric acid trihydrate (NAT). Spectral features from water molecules weakly bound to nitric acid are slightly red-shifted from the symmetric and antisymmetric stretch of water monomers. The solvent-isolated results support a model in which nitric acid is molecular at the aqueous-nitric acid solution interface. The presence of molecular nitric acid at the interface has important consequences for atmospheric chemistry.