OBSERVATION OF THE HYDROPHOBIC EFFECT AT THE HYDRATED 1-METHYL NAPHTHALENE LIQUID SURFACE

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Surface 1-methyl naphthalene (1-MN) molecules of the neat 1-MN liquid have their aromatic rings stacked adjacent to one another with their methyl groups alternating out of the surface and into the subsurface region from molecule to molecule. With the introduction of relatively few water molecules into the 1-MN liquid a rearrangement of the surface molecules is induced, leading to an increased number density of the methyl groups arranged such that more methyl groups are oriented in the same direction into the air phase at the air-liquid 1-MN interface. These structures were elucidated using broad bandwidth sum frequency generation, a surface vibrational spectroscopy. Previously, 1-MN molecules have been measured in atmospheric aerosols; and therefore, these studies have relevance to urban atmospheric aerosol chemistry.