Q49c Processing of ice mantles in a massive star-forming region

下西隆 (神戸大学)、尾中敬、森珠美 (東京大学)、山岸光義 (名古屋大学)、あかり IRC チーム

Chemical reactions in ice mantles differ from gas-phase reactions in various aspects and they play an essential role in the chemical evolution of star-/planet-forming regions particularly in their early evolutionary stage. Understanding the effect of star-formation activities such as outflows on properties of ice mantles is one of the key issues for ice chemistry. For this purpose, it is important to investigate the spatial distribution of ices in star-forming regions. However, previous observations of ices are in many cases limited to single line-of-sight spectroscopy and " ice mapping " observations are currently very few. A massive star-forming region Cepheus A East is one of the ideal targets for such observations thanks to its proximity (∼700 pc). We performed AKARI/IRC near-infrared (2.5 – 5 μm) spectroscopic observations toward this region. The IRC slit was pointed to three positions in Cepheus A East and we extracted approximately 70 spectra from the region. We detected absorption bands of major ice species (H_2O, CO_2, CO) and investigate the spatial distribution of ices and spatial variation of ice chemical compositions around high-mass protostellar objects. We estimate the fraction of thermally processed components of ice mantles by fitting a number of laboratory ice spectra to the observed data. Based on the comparison with the images of the 2.12 μm H_2 line in the literature, we found that the the fraction of thermally processed ices increase in the shocked regions traced by the H_2 line. In this poster, we discuss the effect of radiation and outflows from protostellar objects on the chemical and physical properties of circumstellar ices based on the infrared spectroscopic data.