AOGS 2006


# Properties of Unidentified Infrared Bands Around the Herbig Ae/Be System MWC1080

ITSUKI SAKON[1], YOSHIKO K. OKAMOTO[2], TAKASHI ONAKA[1], HIDEHIRO KANEDA[3], HIROKAZU KATAZA[3]

[1] *Department of Astronomy, School of Science, University of Tokyo*

[2] *Institute of Astrophysics and Planetary Science, Ibaraki University*

[3] *Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency*

We present mid-infrared spectroscopic observations of the Herbig Ae/Be system MWC1080 using the Cooled Mid-Infrared Camera and Spectrometer (COMICS) with the Subaru Telescope. The MWC1080 has a geometry that diffuse nebulous structures extend around the central Herbig B0 type star and a companion, which gives us an ideal opportunity to investigate how the interstellar dust be chemically processed in an early stage of star-forming environments. We particularly focus on the properties of polycyclic aromatic hydrocarbons (PAHs) and PAH-like atomic groups in such environments. A series of the unidentified infrared (UIR) band at 8.6, 11.0, 11.2, 12.0, and 12.7um are recognized in the nebulous structures and we investigate their characteristics along the distance from the central B0 type star. We have found a clear shift in the peak position of 11.2um feature such that it appears around 11.24-11.26um at distant regions from the heating source while it comes up to around 11.28um in the vicinity of the central star. Additionally we have found a clear enhancement of the 11.0/11.2um ratio in the vicinity of central star. Since the 11.0um feature is attributed to a solo-CH out-of-plane wagging mode of cationic PAHs, the larger 11.0/11.2um ratio indicates the higher ionization degree of PAHs. Moreover we have found that the behavior of the 11.0/11.2um ratio and the peak position of 11.2um feature are closely synchronized with each other. In this presentaion, we discuss the use of the UIR 11.0um and 11.2um features as effective indicators of the ratio of the incident radiation field strength Go to the electron density ne, Go/ne, which is supposed to control the ionization degree of PAHs (Bakes, Tielens, & Bauschlicher 2001).