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# Infrared two-colour diagrams for AGB stars using AKARI, MSX, IRAS and NIR data

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Using a revised version of the catalog of AGB stars by Suh & Kwon (2009), we present various infrared two-colour diagrams (2CDs) for 3003 O-rich, 1168 C-rich, 362 S-type and 35 silicate carbon stars in our Galaxy. For each object in the new catalog, we cross-identify the AKARI, MSX and 2MASS counterparts by finding the nearest one from the position information in the IRAS PSC. For the large sample of AGB stars, we present infrared two-colour diagrams using IRAS (PSC), AKARI (PSC and BSC), MSX (PSC) and near infrared (K and L bands; including 2MASS data at KS band) data for different classes of AGB stars based on the chemistry of the dust shell and/or the central star. The infrared 2CDs of AGB stars can provide useful information about the structure and evolution of the dust envelopes as well as the central stars. On the 2CDs, we plot tracks of the theoretical radiative transfer model results with increasing dust shell optical depths. Comparing the observations with the theoretical models on the new 2CDs, we find that the basic model tracks roughly coincide with the densely populated observed points. Generally, we can explain the observations of O-rich and C-rich AGB stars on the various 2CDs with the theoretical models using dust opacity functions of amorphous silicate, amorphous carbon, SiC and corundum. For O-rich AGB stars, we find that the models using corundum as well as silicate can improve the fit with the observations.

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