

Linear proportional relationship between $N(\text{OH})$ and $N(\text{CH})$ in the diffuse interstellar medium

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It has been known that there is a linear proportional relationship between the column densities of CH and OH measured toward bright UV-emitting stars, although there are four outliers in this relationship among the total 24 measured targets. We investigate reasonable configurations of diffuse interstellar medium (ISM) which could explain the observed relationship by considering the followings. First, we identify the locations of 24 targets on the celestial sphere and find that some targets gather together. By using the Simbad database, we count the number of molecular clouds, nebulae, and peculiar stars toward the targets which could contribute to the production of OH and CH. We also search carbon and oxygen line spectra toward 19 targets whose distances were measured in order to find correlation between two molecules and two atoms. We present the results of our search and test a few hypothetical configurations of diffuse ISM which may explain the observed relationship.

Presenter: HONG, SeungYeong

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