Origin of gas in debris disks and Ci observation

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Planets are born in protoplanetary disks. Gas depletion of the disks significantly affects planet formation. However, observational evidence for gas depletion is not obtained yet. Debris disks are believed to be evoluved protoplanetary disks. In some debris disks, CO gases are detected. Such thin CO gases are produced from outgassing of solid bodies that we could not distinguish the origin. We perform PDR calculation for denbris disks, which show that the origin is given from the amount of carbon gases in debris disks. Carbon gases have been detected in debris disks around beta Pic and 49 Cet. From the density ratio between C and CO, we conclude the gases in the debris disks are protoplanetary disk remnant.

Keywords: protoplanetary disk, debris disk, gas depletion

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