

THE GAS-TO-DUST RATIO NEAR STARS AND PROTOSTARS IN THE TAURUS MOLECULAR CLOUD .

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The gas-to-dust (G/D) mass ratio, amounting to approximately 100 in the interstellar medium, may be altered in molecular clouds and circumstellar disks due to dust evaporation, dust settling, condensation of gas etc. Measurements of G/D in dense molecular environments are challenging since they involve strongly extinguished sources of light. We present a study of measuring G/D along the line-of-sights toward T Tau stars and protostars. To estimate G/D, we interpret the ratios between the gas absorption column densities (measured from X-ray absorption) and optical-to-infrared extinction by

dust, and compare these ratios with interstellar values. Alternatively, detailed 3-D dust-disk modeling provides the dust column, although this technique can be used only in exceptional cases for which high-quality images are available. Our X-ray absorption data are derived from a survey of the Taurus region performed with the XMM-Newton satellite, while the mid-IR and optical data are from large surveys of the same region performed with the Spitzer Space Telescope and CFHT, respectively. Near-IR data have also been added from 2MASS.