

## Analysis of Interplanetary Dust Particles

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Interplanetary dust particles (IDPs) are small fragments from asteroids and comets that NASA collects from the Earth's stratosphere after they experience relatively gentle deceleration in the upper atmosphere. One type of IDP, the anhydrous, porous type, appears to be the most primitive, i.e., least altered by aqueous or thermal processing, type of extraterrestrial material available for laboratory analysis. On average, the ~10 micron anhydrous, porous IDPs have an elemental composition similar to the CI-meteorites, which are widely believed to have sampled the Solar Nebula composition, but these IDPs are enriched relative to CI several moderately-volatile minor elements [1]. Elemental and mineralogical comparison of the anhydrous, porous IDPs to the matrix of meteorites has produced no match, suggesting that the anhydrous, porous IDPs are a new, previously unsampled, type of extraterrestrial material. Anders [2] suggested the IDPs may have delivered pre-biotic organic matter, important for the origin of life, to the surface of the early Earth. The IDPs have a carbon content ~3 times the CI value [3], and much of this carbon is organic [4]. Characterization of the organic matter in these IDPs suggests that organic matter was abundant in the early Solar System, even prior to aqueous processing on the asteroids [4]. Since these IDPs appear to be extremely primitive, a detailed comparison of the mineralogy of the anhydrous, porous IDPs with predictions of condensation models can provide a sensitive test of those models.

### References

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