

Conditions For The Production Of Liquid Water In Comet Nuclei

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We have used a thermal evolution code to compute the temperature history of porous icy bodies with radii appropriate to comets (1 - 100 km) at a distance of 100 AU from the sun. The major heat source was the decay of radioactive elements, including ^{26}Al . We allowed for a phase change from amorphous to crystalline ice as the body was heated, as well as cooling by gas flow through the porous medium. We have found that under restricted conditions it is possible to have pressures and temperatures consistent with the presence of liquid water in a comet nucleus for times of the order of 10^5 yrs. Limits on the radius of the body, porosity, pore size, ^{26}Al abundance, and occluded gas content will be presented.