Dissociation of planetary ices at high P,T

JAE-HYUN KLEPEIS, MAGNUS LIPP, BRUCE BAER, CHOONG-SHIK YOO, Lawrence Livermore National Laboratory — The major components of the ice layer of the Jovian planets are methane and ammonia [1]. By adopting laser-heating techniques, we examined methane and ammonia under high pressure and high temperature. XRD and Raman studies showed that ammonia generates nitrogen and that methane dissociates into various hydrogen end products and carbon end products under extreme conditions. From this study, we suggest that the inner layer of Jovian planets gradually loses methane and ammonia by their dissociation process. [1] W.B. Hubbard, Science, 214, 145 (1981).