STANFORD RESEARCH INSTITUTE

To: J. Lederberg

Date: 2/24/61

From: F. R. Mayo

Location:

Subject:

Answering:

Your tracer method of finding cyclohexane tricarboxylic acid is a sound one, but my & main interest is in getting enough cyclic trimer so that a sensitive analysis is not needed. It looks as if my radiation experiments are stalled for a few weeks for lack of assistance.

As for your questions about methane ices in comets and their polymerization, I am no authority on these matters, but I will do the best I can. The vapor pressure of methane is 1 mm. of Hg at 67.3°, 10 mm. at 77.7°K. If your moon isn't big enough to hold an atmosphere, I don't see how a comet can. Even at 10-50°K, I would expect a comet to lose methane in outer space. If it is close enough to ~~receive~~ absorb much solar radiation, its temperature is inevitably much higher.

From the postulate that comets are composed mainly of frozen methane ices, it follows immediately that the polymerization of methane must be inefficient or there wouldn't be so much methane there. ~~I think that~~ Methane is ~~at~~ ~~about the only~~ alkane which is thermodynamically ~~stable~~ most stable. While steady radiation might shift the "equilibrium" slightly toward higher alkanes, it will also prevent them from accumulating.

In summary, I am very dubious about getting much higher alkanes from methane in comets, but I leave it to you as to how good my reasons are

MAYO, F.R.