



FIG. 2.4 Mean apparent thermal conductivity of various multilayer insulation (MLI) as a function of gas pressure in a vacuum space, with a hot-wall temperature $T_{\text{hot}} = 300 \text{ K}$. The MLI is composed of aluminized Mylar layers separated by various insulating spacer layers: (1) Al foil + fiberglass paper (with residual helium gas in the vacuum space) and a cold-wall temperature $T_{\text{cold}} = 20 \text{ K}$; (2) Al foil + fiberglass paper (with residual nitrogen gas) $T_{\text{cold}} = 77 \text{ K}$; (3) double-aluminized Mylar + Dexiglas (with helium gas) $T_{\text{cold}} = 77 \text{ K}$; and (4) crinkled Mylar (NRC-2) (with nitrogen gas) $T_{\text{cold}} = 79 \text{ K}$. (Compiled by Nast 2000 from data in Little 1963, Lockheed 1964, and Boberg 1964.)