AN ENERGY RESOLVED, TRANSLATIONALLY COLD MOLECULAR BEAM FOR COLLISIONAL STUDIES

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A translationally cold molecular beam source based on the collisional cooling technique has been developed. Earlier work resulted in a beam with a very high cluster content. To reduce the cluster concentration, the pulsed source of the earlier experiment was replaced with a continuously open orifice and a mechanical chopper. This provided a higher data acquisition rate and made possible the exploration of lower gas pressure regimes. Electrostatic focusing verified that the new beam was made of monomers. This new approach showed a double-peak speed distribution. An important experimental result is that the beam characteristics are very sensitive to the buffer gas pressure. A model for the observed phenomena will be described.