

Metal Cluster Reactions Studies

By far the most highly visible activity of this group over the past year has been our work on chemical reactivity measurements for bare metal clusters. A copy of a short Communication on this subject is appended along with a short article featuring this work in the Jan 21 issue of Chemical Engineering News.

The key enabling technology for this work was a fast-flow pulsed reactor which fit directly on the supersonic metal cluster source developed in previous years of this DOE contract. This fast flow reactor was mentioned briefly in last year's proposal as being a part-time activity for which we were not at all assured of success. As is evident from this year's publications, the new fast flow reactor turned out to be a major success both in its performance and in the richness of the science it opened up.

As it became increasingly obvious during the year that these neutral metal cluster reaction studies were of major importance, a larger fraction of the group activities were concentrated in this area. As a result we did not place much emphasis on the small cluster spectroscopy originally planned for this year of the contract. As described in the proposal for next year, we do intend to pick up on this spectroscopy again -- particularly through the use of a new depletion spectroscopy approach in the case of the neutrals, and daughter ion appearance in the case of the bare metal cluster ions.