

## Chemical Properties of Mendeleevium

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In the earlier observances in this series commemorating the discovery of new elements, a profusion of information on the chemical properties of the elements 97 (Bk), 98 (Cf), 99 (Es), and 100 (Fm) was available 25 years after their discovery. Many properties obtainable from bulk samples had been measured and we therefore knew of the structure of their metals and simple compounds, their vapor pressures, densities, magnetic susceptibilities, and energy levels in their atoms and molecules. Such information was obtainable only because milligram amounts of Bk, Cf, and Es could be manufactured by neutron irradiation of the lighter actinides. Beginning with Md, a greatly reduced amount of knowledge will ever become available for the reason that the synthesis of these heaviest of the known elements is only possible by ion bombardment of lighter actinide target nuclei. Even with the most intense ion beams and the largest available quantities of target isotope, about  $10^6$  atoms at a time is all the Md that can be produced for chemical studies. This lack of sufficient sample size coupled with the very short lifetimes of the few atoms produced has severely restricted the gathering and broadening of our knowledge concerning the properties of Md and the heavier elements. To illustrate, the literature contains a mere eleven references to the chemical studies of Md, and none of these deal with bulk properties associated with the element bound in solid phases.

The isotope  $^{256}\text{Md}$  is nearly always employed for chemical studies of this element. Besides having a convenient half-life of 77 min, this nuclide can be