

REACTIVITY OF YTTRIUM CLUSTERS WITH AMMONIA AND IONIZATION POTENTIALS OF YTTRIUM NITRIDE CLUSTERS.

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The reactivity of yttrium clusters with ammonia was studied in two different ways. In a first experiment, the reagent was present in the carrier gas. With this approach, the high-temperature vaporization process leads to the formation of yttrium nitride clusters with the general formula  $Y_nN_{n-1}$  ( $n=1,2,3\dots$ ). The ionization potentials (IP) of these clusters have been measured using one-photon photoionization efficiency spectroscopy. Results are compared with DFT calculations which also produce the structures of the most stable forms. In a second experiment, the reactivity of naked yttrium clusters ( $Y_n$ ) with ammonia was studied in a fast-flow reactor. The clusters react readily with ammonia at each collision and no size dependence was observed. The reaction products observed in this case are radically different from those of the previous experiment.