

Abstract Submitted  
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**Inner Shell Studies in Transition Metal Negative Ions: d-shell Photoexcitation and Detachment**<sup>1</sup> R.C. BILODEAU, Western Michigan U. and Lawrence Berkeley National Laboratory - ALS, I. DUMITRIU, WMU and LBNL, N.D. GIBSON, C.W. WALTER, Denison U., J.D. BOZEK, SLAC, Z.D. PESIC, D. ROLLES, WMU and LBNL, N. BERRAH, WMU — Results of the first inner-shell photoexcitation and detachment studies conducted on the transition metal negative ions will be presented. The experiments were conducted on  $\text{Ru}^-$ ,  $\text{Ni}^-$ ,  $\text{Pd}^-$ , and  $\text{Pt}^-$  near the ns, np shells ( $n=3$  for Ni, 4 for Ru and Pd, 5 for Pt), and 4f shell (in Pt). All ions show significant probabilities for multi-electron ejection in the detachment and decay mechanisms, with a total of up to 4 electrons removed. Excitation of a p-electron into the nearly-filled d-shell (in  $\text{Ru}^-$ ,  $\text{Ni}^-$ , and  $\text{Pt}^-$ ) results in strong shape resonances, and excitation of a 4f-electron gives rise to conspicuous Feshbach resonances in  $\text{Pt}^-$ . In contrast, no resonances are observed in  $\text{Pd}^-$ , owing to its completely filled valence 4d shell, in spite of being in the same group as Ni and Pt.

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