ROTATIONALLY RESOLVED PHOTOELECTRON SPECTROSCOPY OF ArXe AND KrXe

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The high resolution spectroscopic information available on the low-lying electronic states of $ArXe^+$ and $KrXe^+$ is limited to vibrationally resolved emission spectra of the C_2 1/2 → (X 1/2, A_2 1/2), B 1/2 → (X 1/2, A_2 1/2) and C_1 3/2 → A_1 3/2 band systems[a,b] and to vibrationally resolved threshold photoelectron spectra of $ArXe^{+}$[c,d] and $KrXe^{+}$[e,f]. Recently *ab initio* potential functions for these states have been reported[g].

Rotationally resolved photoelectron spectra of the lowest three electronic states of $ArXe^+$ and $KrXe^+$ have been recorded by PFI-ZEKE photoelectron spectroscopy following 1_{VUV}+$1'$ resonant two-photon excitation from the X 0^+ ground state of ArXe and KrXe via selected rotational levels of the C 1 and D 0^+ excited states (C 0^+ and D 1 in the case of KrXe)[h,i]. The bandwidth of the vacuum-ultraviolet radiation used to access the intermediate states was narrow enough to enable the selection of individual isotopomers. Photoelectron spectra recorded from several rovibrational levels of the intermediate states provided access to the X 1/2 ($v^+ = 0-15$), A_1 3/2 ($v^+ = 0-3$) and A_2 1/2 ($v^+ = 0-8$) levels of $ArXe^+$ and the X 1/2 ($v^+ = 5, 22, 28$) and A_1 3/2 ($v^+ = 3-5$) levels of $KrXe^+$. The analysis of the rovibrational structure of the photoelectron spectra led to improved spectroscopic parameters for these states and to a better description of the low-lying electronic states of $ArXe^+$ and $KrXe^+$.

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