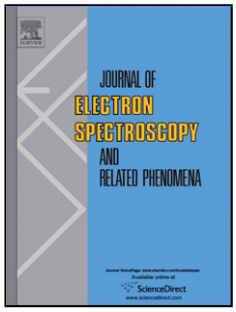

Title: Recoil-induced vibrational excitation in inner-shell photoelectron spectra: Beyond the linear coupling model

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A comparison is made of three models – linear coupling model, harmonic oscillator, and Morse oscillator -- for calculating the combined effects of Franck-Condon and recoil-induced vibrational excitation accompanying inner-shell ionization.

In each case the two effects are found to be independent and additive.

To a good approximation, the vibrational profile from the two combined effects is the convolution of the vibrational profile for the two individual effects.

The relationship between the intensity ratio (v=1)/(v=0) and the average vibrational excitation energy is explored.