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Intermediate energy electron impact excitation of composite vibrational modes in phenol

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ABSTRACT

We report differential cross section results from an experimental investigation into the electron impact excitation of a number of the low-lying composite (unresolved) vibrational modes in phenol ($\text{C}_6\text{H}_5\text{OH}$). The measurements were carried out at incident electron energies in the range 15–40 eV and for scattered-electron angles in the range 10–90°. The energy resolution of those measurements was typically ~80 meV. Calculations, using the GAMESS code, were also undertaken with a B3LYP/aug-cc-pVDZ level model chemistry, in order to enable us to assign vibrational modes to the features observed in our energy loss spectra. To the best of our knowledge, the present cross sections are the first to be reported for vibrational excitation of the $\text{C}_6\text{H}_5\text{OH}$ molecule by electron impact.

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