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Spectroscopy of ^{63}V and Spectroscopic Factors in the N=40 Island of Inversion

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We propose proton knockout from ^{64}Cr to ^{63}V. For a deformed ground state (as may be expected) the odd proton can be removed from low-lying Nilsson states for example the $\Omega = 3/2$ levels originating from the $d_{3/2}$ or $f_{7/2}$ shell model states. The spectroscopy will provide an important measure of the relative energies of the proton states, which is sensitive to the deformation, spherical gap, and pairing. Indeed the odd system can often offer more insight into the underlying structure than the even core. The spectroscopic factors (overlap between ^{64}Cr and ^{63}V) provide a measure of the occupancies and a test of the model predicted wavefunctions, either Nilsson or shell-model derived. This allows a comparison between these differing starting points.

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