

Answer on Question #51225, Physics, Other

Task: Write down the spectral terms for the ground states of ^{25}Mn and ^{38}Sr

Answer:

The spectral terms for the ground states of ^{25}Mn :

$$^{25}\text{Mn} : 1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$$

$$n = 1 : 1S_{\frac{1}{2}}$$

$$n = 2 : 2S_{\frac{1}{2}}, 2P_{\frac{1}{2}}, 2P_{\frac{3}{2}}$$

$$n = 3 : 3S_{\frac{1}{2}}, 3P_{\frac{1}{2}}, 3P_{\frac{3}{2}}, 3D_{\frac{3}{2}}, 3D_{\frac{5}{2}}$$

$$n = 4 : 4S_{\frac{1}{2}}$$

The spectral terms for the ground states of ^{38}Sr :

$$^{38}\text{Sr} : 1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4p^6 5s^2$$

$$n = 1 : 1S_{\frac{1}{2}}$$

$$n = 2 : 2S_{\frac{1}{2}}, 2P_{\frac{1}{2}}, 2P_{\frac{3}{2}}$$

$$n = 3 : 3S_{\frac{1}{2}}, 3P_{\frac{1}{2}}, 3P_{\frac{3}{2}}, 3D_{\frac{3}{2}}, 3D_{\frac{5}{2}}$$

$$n = 4 : 4P_{\frac{1}{2}}, 4P_{\frac{3}{2}}$$

$$n = 5 : 5S_{\frac{1}{2}}$$