

Electron Configuration Worksheet

Name: Key
Date:
Block:

What is the electron configuration for the following?

1. Sc $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$
2. ~~At~~ Ni $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$
3. Fe $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
4. Xe $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
5. B $1s^2 2s^2 2p^1$
6. Na $1s^2 2s^2 2p^6 3s^1$
7. K $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
8. Pd $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^8$
9. I $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$
10. F $1s^2 2s^2 2p^5$

Which element is represented by the following?

11. $1s^2 2s^2 2p^6 3s^2 3p^3$ Phosphorus
12. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^{14} 6d^{10} 7p^2$ Ununquadium
13. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^6$ Osmium
14. $1s^2 2s^1$ Lithium
15. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ Rubidium
16. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10}$ Cadmium
17. $1s^2 2s^2 2p^6 3s^2 3p^2$ Silicon
18. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$ Bromine
19. $1s^2 2s^2 2p^6$ Neon
20. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$ Titanium

In the space below, write the electron configurations and orbital diagrams of the following elements/ions.

Element	Electron Configuration	Orbital Diagram
Na ⁺ 11e⁻ 10e ⁻	1s ² 2s ² 2p ⁶	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p}$
Fe ²⁺ 26e⁻ 24e ⁻	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ⁴	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{4s} \quad \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d}$
Ar 18e ⁻	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \frac{1\uparrow}{3p}$
Br ⁻ 35e⁻ 36e ⁻	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{4s} \quad \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \quad \frac{1\uparrow}{4p} \frac{1\uparrow}{4p} \frac{1\uparrow}{4p}$
Mg 12e ⁻	1s ² 2s ² 2p ⁶ 3s ²	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s}$
Co 27e ⁻	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ⁷	$\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow\uparrow}{2p} \frac{1\uparrow}{2p} \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{4s} \quad \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d} \frac{1\uparrow}{3d}$

Determine which of the following electron configurations are not valid? Explain:

11) 1s²2s²2p⁶3s²3p⁶4s²4d¹⁰4p⁵ 3d, not 4d

12) 1s²2s²2p⁶3s³3d⁵ 3s² also: 3p