

TUGAS KIMIA UMUM A (kelompok jadual kuliah Senin jam 08.00)

1. Which of Dalton's postulates about atoms are inconsistent with later observations? Do these inconsistencies mean that Dalton was wrong? Is Dalton's model still useful? Explain clearly.
2. Given that the ions in LiF and in MgO are of similar size, which compound has stronger ionic bonding? Use Coulomb's law in your explanations.
3. Rank the following photons in terms of decreasing energy: (a). IR ($\nu=6.5 \times 10^{13}$ per second), (b). microwave ($\nu=9.8 \times 10^{11}$ per second), and (c). UV ($\nu=8.0 \times 10^{15}$ per second)
4. Are the following quantum number combinations allowed? If not, show two ways to correct them: (a). $n=2, l=0, m_l=-1$; (b). $n=4, l=3, m_l=-1$; (c). $n=3, l=1, m_l=0$; (d). $n=5, l=2, m_l=+3$
5. Explain the difference of Hund's rule, Pauli exclusion principle, and Aufbau principle. Give clear example if needed.
6. Write the condensed ground-state electron configuration of these transition metal ions, and state which are paramagnetic: (a). V^{3+} ; (b). Cd^{2+} ; (c). Co^{3+} ; (d). Ag^+
7. The NaCl crystal structure consists of alternating Na^+ and Cl^- ions lying next to each other in three dimensions. If the Na^+ radius is 56.4% of the Cl^- radius and the distance between Na^+ nuclei is 566 pm, what are the radii of the two ions?
8. Define bond energy using the H-Cl bond as an example. When this bond breaks, is energy absorbed or released? Is the accompanying ΔH value positive or negative? How do the magnitude and sign of this ΔH value relate to the value accompanying H-Cl bond formation?