

2. Exercise General Chemistry

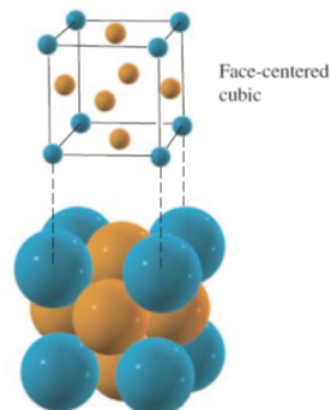
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WS 2024/25

Due Jan 23st, 2024, 2pm c.t., AR-H100

2.1

Gold crystallizes in a face-centered cubic lattice with the edge length 4.070\AA . The density is 19.3g/cm^3 . Calculate the mass of a gold atom from this information.



2.2

What is the shortest wavelength light, that can be emitted by hydrogen when the final state has the quantum number 2? Specify the wavelength and frequency of the emitted light.

2.3

Write down the electronic states of the following ions:

Br^- , K^+ , S^{2-} und Ga^{3+}

2.4

Carbon monoxide has a covalent triple bond. Which atomic orbitals will combine to form the molecular orbitals? Draw the molecular orbitals. Describe the individual bindings. What is the number of lone pairs of electrons?

2.5

Give the Lewis formulas including lone pairs of electrons for the following molecules or ions: CCl_4 , CH_2O , NO_3^- , N_2O_5 und NH_4Cl an.

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2.6

What is the molar amount of 5 kg of hexane?

2.7

The stainless steel with the material number 1.4465 contains 25 wt .-% Cr, 24 wt .-% Ni and 2 wt .-% Mo, all the rest is iron. Calculate the molar fractions of all metals contained.