

further examples:

1. typical ions

please choose 2 anions and cations each from the main groups of the periodic table from within the first 4 periods. Specify symbol, name, electron configuration and charge.
Form 4 possible stoichiometric compounds and name them.

cation	anion	charge	compound	name of the compound
Na^+		+1	NaF	sodium fluoride
Ca^{2+}		+2	Na_2S	sodium sulfide
	F^-	-1	CaF_2	Calcium fluoride
	S^{2-}	-2	CaS	calcium sulfide

2. Choose 2 examples for ionic and covalent compounds each. Specify the molecular formula and the name of the substance. Draw the Lewis structure.

sodium chloride: NaCl $[\text{Na}]^+ [:\text{Cl}:]^-$ ionic

magnesium chloride: MgCl_2 $[:\text{Cl}:]^- [\text{Mg}]^{2+} [:\text{Cl}:]^-$ ionic

hydrogen chloride: HCl $\text{H}-\text{Cl}::$ covalent

molecular oxygen: O_2 $::\text{O}=\text{O}::$ covalent

3. Describe the type of bonding in MgCl_2 and in PCl_3 .

– MgCl_2 : ionic bond: based upon the electrostatic attraction between anion and cation

- PCl_3 : covalent bond: atoms share a pair of electrons

4. Which kind of bond is joining the following substances, please complete the table:

substance	molecular formula	type of bond
metallic iron	Fe	metallic
calcium bromide	CaBr_2	ionic
silicon dioxide	SiO_2	covalent
sodium sulfide	Na_2S	ionic

5. Consider the strontium iodide molecule, specify the type of bond, and calculate the molecular mass.

SrI_2 : ionic bond

$$M_{\text{SrI}_2} = 87,62 + 2 \times 126,9 = 341,42 \text{ g/mol}$$

6. What is the molecular formula for calcium hydroxide? What kind of bond can be found between the atoms? Calculate the molar mass.

Ca(OH)_2 : ionic bond between Ca^{2+} and OH^- , and covalent bond between O and H

$$M_{\text{Ca(OH)}_2} = 40,08 + 2 \times (16 + 1,01) = 74,1 \text{ g/mol}$$

7. What is the molecular formula for magnesium sulfate? What kind of bond can be found between the atoms? Calculate the molar mass

MgSO_4 : ionic bond between Mg^{2+} und SO_4^{2-} , covalent bond between O und S

$$M_{\text{MgSO}_4} = 24,31 + 4 \times 16 + 32,07 = 120,38 \text{ g/mol}$$

8. What is the molecular formula for phosphorus trichloride? Calculate the molar mass .

PCl_3 : covalent bond

$$M_{\text{PCl}_3} = 30,97 + 3 \times 35,45 = 137,32$$

9. Explain the ionization of metallic calcium by a reaction equation



10. Explain the formation of an arsenide ion with a reaction equation

