

1) Balance the following equation:



a) Name each reactant

copper(II) nitrate sodium phosphate

b) Name each product

sodium nitrate copper(II) phosphate

c) What type of reaction is this?

Double Replacement - precipitation

2) In each of the following the names are incorrect for the formula unit given. Make the correction.

1) Cl_2O chlorine(II) oxide

dichlorine monoxide

2) $\text{Ni}(\text{NO}_3)_2$ nickel nitrite

nickel(II) nitrate

3) VN vanadium(I) nitride

vanadium(III) nitride

4) CaI_2 calcium(II) iodide

calcium iodide

5) KCH_3COO potassium carbonate

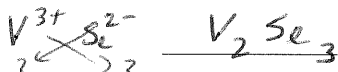
potassium acetate

6) P_2O_5 phosphorus oxide

diphosphorus pentoxide

3) Give the formula that corresponds to the given name.

a) vanadium(III) selenide



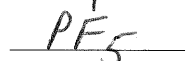
b) calcium hydrogen carbonate



c) ammonium acetate



d) phosphorus pentafluoride



e) titanium(IV) nitrate



4) Give the name that corresponds to the given formula.

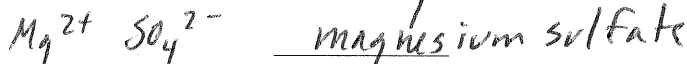
a) CoCO_3



b) N_2O_4

dinitrogen tetroxide

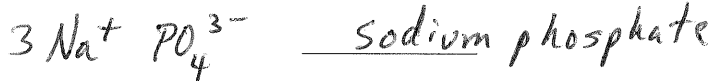
c) MgSO_4



d) LiCl



e) Na_3PO_4



5) Balance the following equations and classify them as one of the listed terms:

combination (C)

unclassifiable(U)

double replacement-precipitation (DR-PPT)

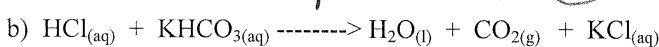
decomposition (D)

single replacement (SR)

double replacement-neutralization (DR-N)

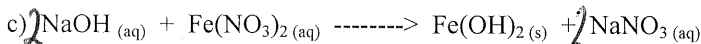


(U) or combustion or redox

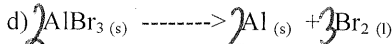


Balanced as is

(DR-N)

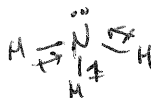
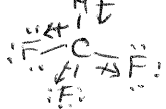
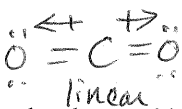


(DR-PPT)



(D)

6)



a) Complete the phrase with the term POLAR or NON-POLAR.

i) CO₂ is non-polar. ii) CHF₃ is polar. iii) NH₃ is polar.

b) What type of intermolecular force (dispersion, dipole-dipole, and hydrogen bonding) is dominant in each substance?

i) CO₂ dispersion. ii) CHF₃ dipole-dipole. iii) NH₃ H-bonding.

c) The general rule, "like dissolves like", indicates that substances with similar intermolecular forces will dissolve one another.

Based on your answers in part b, which compounds will dissolve easily in water? Briefly explain your answer.

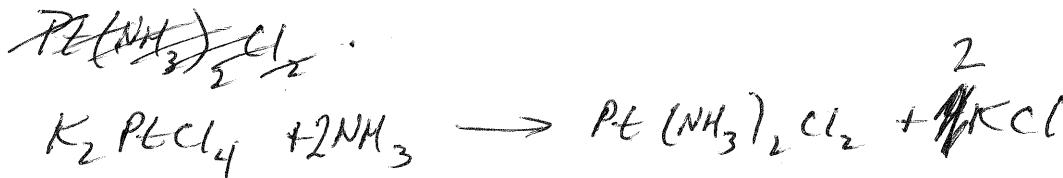
H₂O has H-bonding as the dominant force
 so NH₃, which also has H-bonding, should dissolve well.

d) Which substance has the lowest boiling point? Explain. CO₂

CO₂ molecules are held together by weak forces (compared to the dipole-dipole + H-bonding)
 weak forces are more easily overcome with lower energy

7) Cisplatin, Pt(NH₃)₂Cl₂, a compound used in cancer treatment, is produced by the reaction of ammonia (NH₃) and potassium tetrachloroplatinate (K₂PtCl₄). The other product is potassium chloride.

a) Write the balanced equation for the reaction.



Thus
 CO₂ has
 the lowest
 bp.

b) How many grams of ammonia are needed to react completely with 55.8 g of K₂PtCl₄?

55.8 g K₂PtCl₄	1 mol K₂PtCl₄	2 mol NH₃	17.03 g NH ₃
1	415.1 g K₂PtCl₄	1 mol K₂PtCl₄	1 mol NH ₃
3 sf	4 sf	exact	4 sf

~~17.03 g NH₃~~
= 4.578 g NH₃