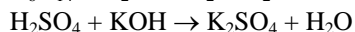
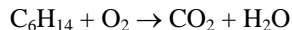
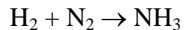
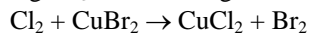
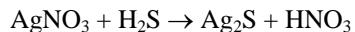


Unit 2 Practice Problems (with answers at end)

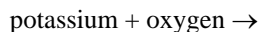
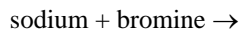
The gods too are fond of a joke. --Aristotle

Balancing chemical reactions

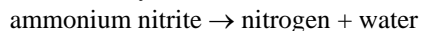
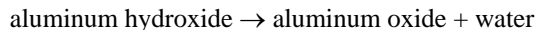
1. Balance each equation below and tell which of the three types of reactions is involved.



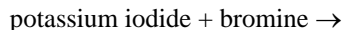
2. The following are the beginnings of *combination* reactions. Write balanced reactions for them.



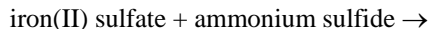
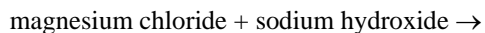
3. The following are *decomposition* reactions. Write balanced reactions for them.



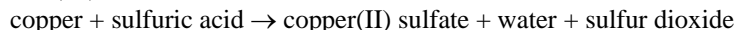
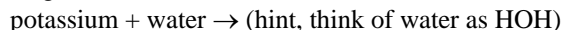
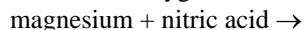
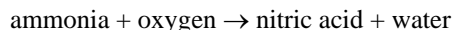
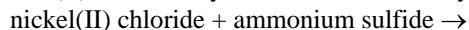
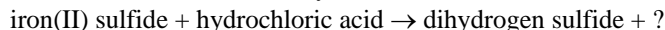
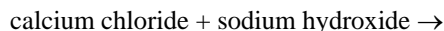
4. The following are the beginnings of *redox displacement* reactions. Write the balanced equations for them.



5. The following are the beginnings of *precipitation* reactions. Write balanced equations for them.



6. Where the word equation is complete, write and balance the chemical equation. Where the word equation is incomplete, complete it and write and balance a chemical equation.



7. If the reactions above are known to occur in water solution, write net-ionic equations that represent the reactions.

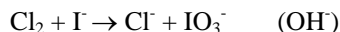
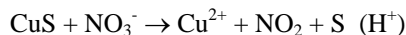
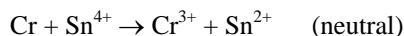
[insoluble substances are: $\text{Ca}(\text{OH})_2$, FeS , NiS , Mg , K , Fe_2O_3 , Fe , Cu]

[gases include: NH_3 , H_2S , H_2 , Cl_2 , CO_2 , SO_2]

Innovators are inevitably controversial.
--Eva LeGallienne

Balancing redox reactions

8. Balance the following redox reactions.



Oxidation numbers and definitions

9. Return to the previous problem and for each reaction, assign oxidation numbers to each atom in the reaction, label the oxidizing agent (OA) and the reducing agent (RA).

Predicting when a reaction will occur

10. In each case below use solubility rules or the activity series to predict if a reaction will occur or not.

- NaCl + AgNO₃ → ?
- K₂SO₄ + NH₄Cl → ?
- Cu + AgNO₃ → ?
- Zn + MgSO₄ → ?
- Br₂ + FeCl₃ → ?
- Ag + SnCl₂ → ?
- Ba(NO₃)₂ + Li₂SO₄ → ?

Answers

1. 2,1,1,2 precipitation

1,1,1,1 halogen displacement (redox)

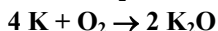
3,1,2 combination

2,1,1,1 decomposition

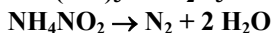
2,19,12,14 combustion

1,2,1,2 acid/base

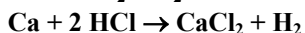
2. 2 Na + Br₂ → 2 NaBr



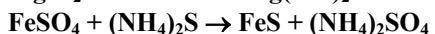
3. 2 Al(OH)₃ → Al₂O₃ + 3 H₂O



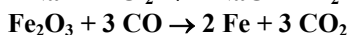
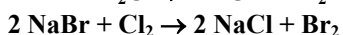
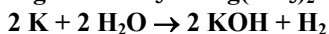
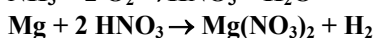
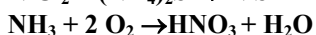
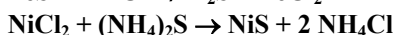
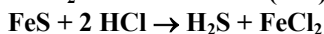
4. 2 KI + Br₂ → I₂ + 2 KBr



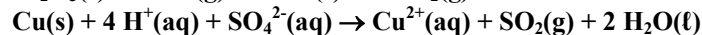
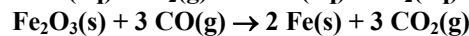
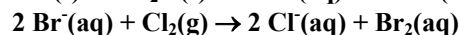
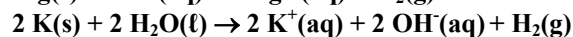
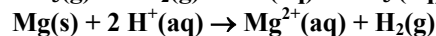
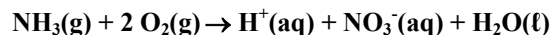
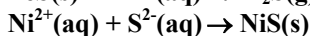
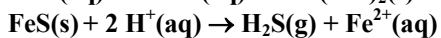
5. MgCl₂ + 2 NaOH → Mg(OH)₂ + 2 NaCl



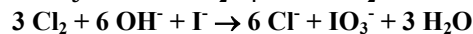
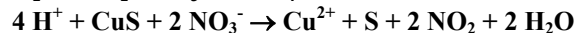
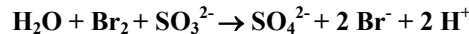
6. CaCl₂ + 2 NaOH → Ca(OH)₂ + 2 NaCl



7. Ca²⁺(aq) + 2 OH⁻(aq) → Ca(OH)₂(s)

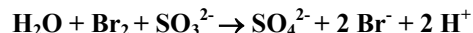


8. 2 Cr + 3 Sn⁴⁺ → 2 Cr³⁺ + 3 Sn²⁺

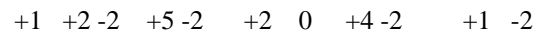


9.

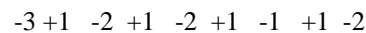
	0	+4		+3		+2	



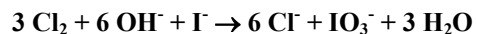
OA RA



RA OA



RA OA



OA RA

10. a. yes, ppt b. no c. yes d. no e. no f. no g. yes, ppt