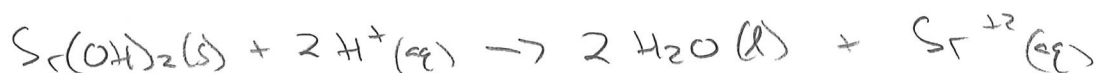
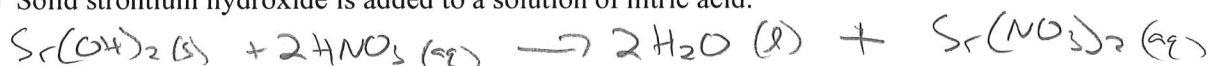


These questions were taken from the 2006-2009 free response sections of the AP exam. If the question requires problem solving, please show your work and express your answer with the correct number of significant figures. If the question requires you to explain something, please do so in clear concise sentences using appropriate chemical principles.

Write the formulas to show the reactants and products for each reaction. All reactants are in aqueous solution unless otherwise indicated. Represent substances in solution as ions if the substance is extensively ionized. Omit formulas for any ions or molecules that are unchanged by the reaction. In all cases a reaction occurs. You must balance the equations in lowest possible whole number ratios.

2008

A) Solid strontium hydroxide is added to a solution of nitric acid.



B) A solution of barium chloride is added drop by drop to a solution of sodium carbonate, causing a precipitate to form.

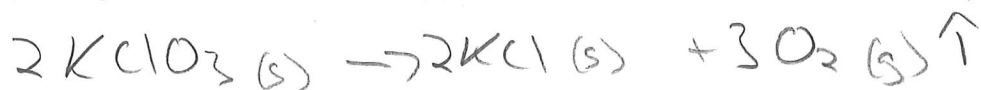


C) Chlorine gas, an oxidizing agent, is bubbled into a solution of potassium bromide at 25°C.

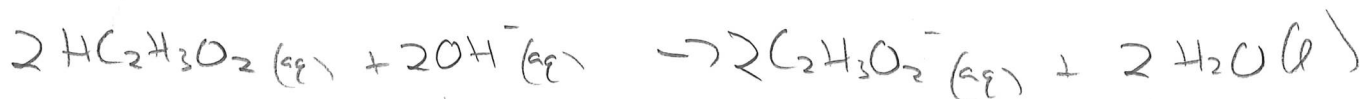
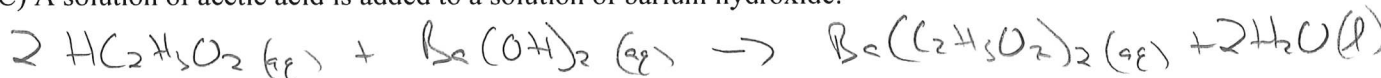


2006

A) Solid potassium chlorate is strongly heated.



C) A solution of acetic acid is added to a solution of barium hydroxide.



D) Zinc metal is placed in a solution of copper(II) sulfate.



E) Hexane is combusted in air.



2009

A) A barium nitrate solution and a potassium fluoride solution are combined and a precipitate forms.



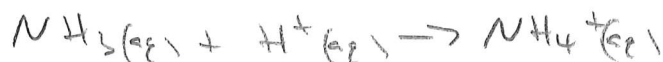
B) A piece of cadmium metal is oxidized by adding to a solution of copper(II) chloride..



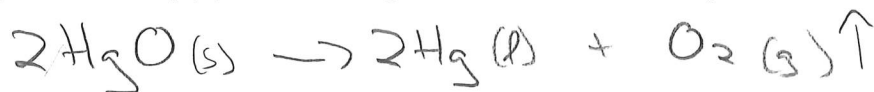
★ C) A sample of solid ferric(iron (III)) oxide is reduced completely with solid carbon.



D) Equal volumes of equimolar solution of ammonia and hydrochloric acid are mixed.



E) Solid mercury(II) oxide decomposes as it is heated in an open test tube in a fume hood

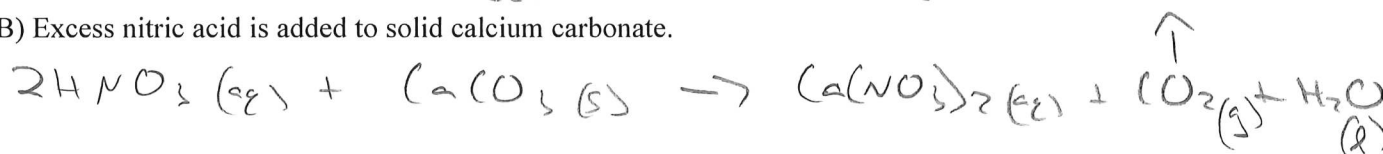


2007

A) A solution of sodium hydroxide is added to a solution of lead(II) nitrate.



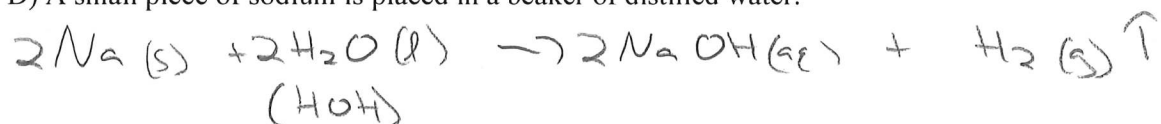
B) Excess nitric acid is added to solid calcium carbonate.



C) A solution containing silver(I) ions (an oxidizing agent) is mixed with a solution containing iron(II) ions (a reducing agent)..

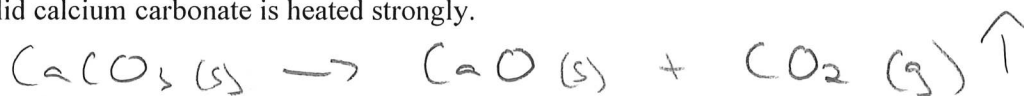


D) A small piece of sodium is placed in a beaker of distilled water.



2006

A) Solid calcium carbonate is heated strongly.



B) A strip of magnesium metal is placed in a solution of iron(II) chloride.



C) Solid ammonium chloride is added to a solution of potassium hydroxide.



D) Propanol is burned in air.



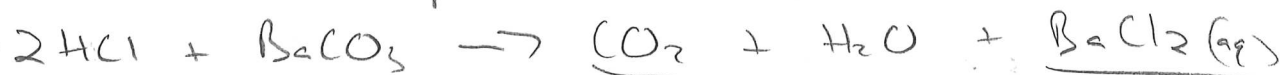
E) A strip of aluminum foil is placed in liquid bromine.



Follow-up questions:

1) 2008 letter B-If a few drops of hydrochloric acid are added to the resulting solution, what would be observed? Explain.

Bubbles - CO_2 produced and less precipitate



2) 2006 letter A-What is the oxidation number on chlorine in the potassium chlorate molecule?



3) 2006 letter D-What happens to the color of solution as the reaction proceeds?

Blue \rightarrow clear

4) 2006 letter E-How many moles of gaseous products are produced when **1 mole** of hexane is combusted?

13 mols (6 + 7)

5) 2009 letter B-List 2 visible changes you would see that would indicate a reaction is occurring?

Solid Cu forming

Solution becomes less blue as $CuCl_2$ reacts

6) 2009 letter E-After the reaction is complete, is the mass of the material in the testtube greater than, less than, or equal to the mass of the original sample? Explain.

Less, O_2 gas leaves the test tube

7) 2006 form B letter A-If the gaseous product is bubbled through lime water, what happens to the lime water?

A The CO_2 will form a $CaCO_3$ precipitate

8) 2006 form B letter D-What organic functional group is found in propanol?

OH \rightarrow hydroxyl