Name: _____

AP Chemistry Chemical Equations Worksheet

Write the balanced chemical equation (excluding spectator ions) underneath each reaction description, and answer the question.

(a) A solution of ammonia is added to a dilute solution of acetic acid.	Identify the conjugate acid–base pairs in this reaction.
(b) Solutions of sodium hydroxide and acetic acid are mixed.	Acetic acid is a weak acid. If equal volumes of equal molar solutions are mixed, will the solution pH be >7, 7, or <7? Explain.
(c) Hydrogen sulfide gas is bubbled through excess potassium hydroxide solution.	Write the successive ionization equations for H_2S.
(d) Solid barium oxide is added to distilled water.	Is the resulting solution acidic, basic or neutral? Explain.
(e) Solid calcium oxide is exposed to a stream of carbon dioxide gas.	What type of reaction has occurred?
(f) Solid dinitrogen pentoxide is added to water.	Is the final solution acidic, basic or neutral? Explain.
(g) Carbon disulfide vapor is burned in excess oxygen.	What is the oxidizing agent in this reaction?

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(h) Lithium metal is burned in air.	Besides combustion, what type of reaction could this be classified as?
(i) A solution of diamminesilver(I) chloride is treated with dilute nitric acid.	What is the driving force for this reaction?
(j) A concentrated solution of ammonia is added to a suspension of zinc hydroxide.	What are the possible molecular geometries for the complex ion product?
(k) Excess concentrated sodium hydroxide solution is added to solid aluminum hydroxide.	Name any complex ion formed in the reaction.
(l) Solid ammonium carbonate is heated.	Classify the type of reaction occurring.
(m) A solution of hydrogen peroxide is catalytically decomposed.	Name the element being reduced and the element being oxidized.
(n) A solution of potassium iodide is electrolyzed.	At which electrode would a gas be released?
(o) A solution of copper(II) sulfate is electrolyzed using inert electrodes.	Is the final solution acidic, basic or neutral?
(p) A solution of ammonium sulfate is added to a saturated solution of barium hydroxide.	Identify any precipitate formed in the reaction.
(q) A solution of copper(II) chloride is added to a solution of sodium sulfide.	Name the spectator ions in this reaction.
(r) Solutions of manganese(II) sulfate and ammonium sulfide are mixed.	List any precipitate that forms during the reaction.

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(s) Solutions of silver nitrate and sodium chromate are mixed.	What is the oxidation number of chromium in the chromate ion?
(t) Glacial acetic acid is mixed with liquid methanol (nonaqueous).	What type of organic reaction can this be characterized as?
(u) Chlorine gas is bubbled into a cold, dilute solution of potassium hydroxide.	What element is undergoing oxidation and what element is undergoing reduction?
(v) A strip of copper is immersed in a concentrated nitric acid solution.	List at least two observations that indicate a chemical reaction is occurring.
(w) Hydrogen gas is passed over hot iron(II) oxide powder.	What is the oxidation number of the hydrogen in hydrogen gas?
(x) Acidified potassium permanganate is added to a solution of sodium nitrite.	Write and balance the oxidation half-reaction for mass and charge.
(y) A solution of sodium bromide is added to an acidified solution of potassium bromate.	Write and balance the reduction half-reaction for mass and charge.
(z) Aluminum metal is added to a solution of copper(II) chloride.	List at least two observations that indicate a chemical reaction is occurring.
(aa) Excess chlorine gas is passed over hot iron filings.	What type of reaction is occurring?
(bb) Magnesium metal is added to nitrogen gas.	What is the oxidation number of magnesium before and after the reaction?

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(cc) Solid lithium hydride is added to distilled water.	Is the final solution acidic, basic or neutral? Explain.
(dd) Benzene is treated with bromine in the presence of a catalyst.	Classify the type of organic reaction that takes place.
(ee) Solid lithium oxide is added to excess water.	Is the final solution acidic, basic or neutral? Explain.
(ff) Solid potassium chlorate is heated in the presence of manganese dioxide as a catalyst.	How many moles of reaction products can be produced from one mole of potassium chlorate?
(gg) Dilute hydrochloric acid is added to a solution of potassium sulfite.	List all spectator ions.
(hh) A solution of sulfuric acid is added to a solution of barium hydroxide until the same number of moles of each compound has been added.	Is the final solution acidic, basic or neutral? Explain. .
(ii) A mixture of solid calcium oxide and solid tetraphosphorus decaoxide is heated.	Is the product compound(s) soluble in water?
(jj) Sulfur dioxide gas is passed over solid calcium oxide.	Name the product compound(s).
(kk) Solid zinc sulfide is heated in an excess of oxygen.	What change in oxidation state does sulfur undergo in this reaction?
(ll) A solution of potassium iodide is added to an acidified solution of potassium dichromate.	What is the reducing agent in this reaction?

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