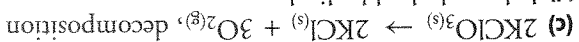


Answers to Inquiry Questions

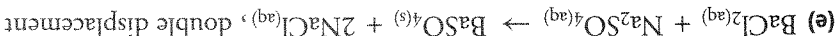
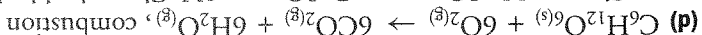
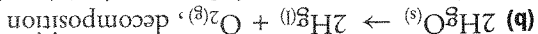
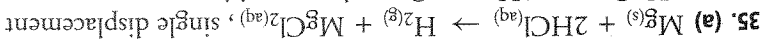
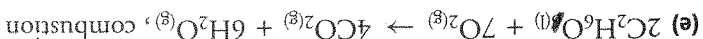
33. Classification allows better understanding of the reactions, simplifies the nature of each reaction, can generalize each reaction type for better understanding and explanation.



(b) balanced, synthesis



(d) balanced, double displacement



36. Students should state the properties they are testing for. It is trivial to test for many qualitative properties; physical state at room temperature and colour can be described just by looking at the sample. Students may come up with interesting ways to test for malleability, ductility, hardness, and brittleness. Quantitative properties that are fairly straightforward to test for are density, solubility, and electrical conductivity. Ensure that students provide a detailed procedure that addresses safety and includes controls where appropriate.

37. Students should use Investigation 4-A as a model. They should note that the

production of hydrogen gas indicates that a reaction has taken place.

38. In Trial #1 the mass of paper and powder should be reported to 2 decimal places. In Trial #2 the mass of filter paper should be reported to 2 decimal places. Also, the mass of calcium sulfate should be 8.61 g according to the data. In Trial #3 the mass of calcium sulfate should be reported to 2 decimal places.

39. Students' procedures will probably include tests to compare the several different

properties of metals and non-metals. For example, metals tend to be ductile and malleable solids, while non-metals tend to be gases, liquids, or brittle or crystalline solids. Solid metals tend to conduct electricity, while non-metals do not.

Students may also propose carrying out various reactions to test the reactivity of the unknown substances with reactants such as acids. Accept all reasoned and reasonable answers, and ensure students have included safety considerations in their procedures.

40. (a) Based on appearance, the compound could be either ionic or covalent.

(b) Both salt-like crystals (NaCl) and sugar-like crystals fit the description of the

compound.

(c) Students' procedures could include testing for the melting point of the unknown compound and for the conductivity of a solution of the unknown compound.

41. (a) The reaction is a single displacement reaction, in which metal X is displacing

metal Z.

(b) X is more reactive since it is displacing Z from its compound.

(c) Possible combinations of substances that would behave like metal X and

compound ZSO_4 are: zinc metal and copper(II) sulfate, magnesium metal and

zinc sulfate.