Section 20.4  PREPARATION AND CHEMILUMINESCENCE OF LUMINOL

1. Write the acid-base reaction that occurs when 3-nitrophthalic acid and hydrazine are combined.

2. Mechanistically, the conversion of 3-nitrophthalic acid and hydrazine to 3-nitrophthalhydrazide (underline all answers that apply) is (a) an elimination reaction, (b) a nucleophilic substitution reaction, (c) a nucleophilic addition-elimination reaction, (d) an electrophilic substitution reaction, (e) a free-radical substitution reaction, (f) an oxidation of the aromatic substrate, (g) a reduction of the aromatic substrate, (h) none of these.

3. Why is triethylene glycol rather than ethylene glycol used as the solvent for the preparation of 5-nitrophthalhydrazide?

4. What are the reported melting points of 5-nitrophthalhydrazide and luminol?

5. Why is acetic acid added to the reaction mixture prior to the isolation of luminol?

6. In what type of environment should the chemiluminescence experiment be conducted?

7. What color do you expect to see as a result of the chemiluminescence of luminol?
8. What symptoms may occur if hydrazine is inhaled?

9. What symptoms may occur if 3-nitrophthalic acid gets into your eyes and what action(s) should be taken if it does?

10. What is recommended as a means of extinguishing a fire involving 3-nitrophthalhydrazide?

11. What action should be taken if glacial acetic acid gets on your skin?

12. What symptoms accompany ingestion of 3-aminophthalhydrazide?