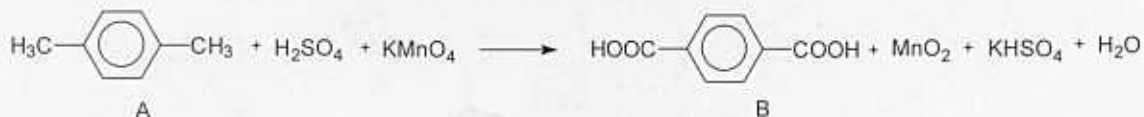
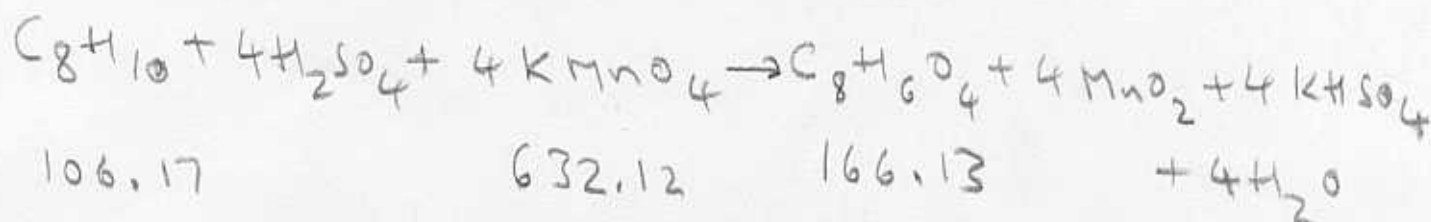


Five grams of p-xylene (A) are oxidized with 38 g potassium permanganate in excess sulfuric acid. Four grams of terephthalic acid (B) are isolated. (Atomic weights: C = 12.011, H = 1.008, S = 32.066, O = 16.000, Mn = 54.938, K = 39.098). The reaction proceeds as shown below:



1. Show a balanced reaction equation for this reaction. Use sum formulas. (3 pts).



2. What was the limiting reactant? Show your calculations! (2 pts).

$$\frac{5.0}{106.2} \times 632.1 = 29.8 \text{ g KMnO}_4 \text{ needed}$$

→ xylene is limiting

3. How many grams theoretical yield do you expect for terephthalic acid? Show your calculations! (3 pts).

$$\frac{5.0}{106.2} \times 166.1 = 7.8 \text{ g}$$

4. What % yield of theory was obtained? Based on which limiting reactant? Show your calculations! (3 pts).

$$\frac{4.0}{7.8} \times 100 = 51.2\% \text{ based on xylene}$$

5. Check all that apply! (4 pts)

Compound	flammable	corrosive
potassium hydroxide		✓
chloroform		