7) $C_6H_4(OH)_2 + 3H_2O_2 \rightarrow C_6H_4O_2 + 4H_2O + O_2$

100.0 mg — 50.0 mg — ____ mg

.1000 g — .0500 g

ER →

$$.1000\,g\,C_6H_4(OH)_2 \left|\frac{1}{110.12\,g\,C_6H_4(OH)_2}\right| \frac{1\,mol\,C_6H_4(OH)_2}{1\,mol\,C_6H_4(OH)_2} \left|\frac{1\,mol\,C_6H_4O_2}{1\,mol\,C_6H_4(OH)_2}\right| \frac{108.10\,g\,C_6H_4O_2}{1\,mol\,C_6H_4O_2} = .0982\,g\ C_6H_4O_2$$

98.2 mg

LR →

$$.0500\,g\,H_2O_2 \left|\frac{1}{34.02\,g\,H_2O_2}\right| \frac{1\,mol\,H_2O_2}{3\,mol\,H_2O_2} \left|\frac{1\,mol\,C_6H_4O_2}{1\,mol\,C_6H_4O_2}\right| \frac{108.10\,g\,C_6H_4O_2}{1\,mol\,C_6H_4O_2} = .0530\,g\ C_6H_4O_2$$

53.0 mg

Theoretical Yield

To find amount of excess <u>used</u> → turn LR into ER

$$.0500\,g\,H_2O_2 \left|\frac{1}{34.02\,g\,H_2O_2}\right| \frac{1\,mole\,H_2O_2}{3\,mol\,H_2O_2} \left|\frac{1\,mol\,C_6H_4(OH)_2}{1\,mole\,C_6H_4(OH)_2}\right| \frac{110.12\,g\,C_6H_4(OH)_2}{1} = .0539\,g\ C_6H_4(OH)_2$$

53.9 mg

<u>used</u>

100.0 mg − 53.9 mg = 46.1 mg

available − used = excess