Synthesis and characterization of tetraphenylporphyrin and Ni(II)-tetraphenylporphyrin

Equations:

(1)
$$4 \left(\begin{array}{c} \\ \\ \\ \\ \\ \\ \end{array} \right) \left(\begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right) + 4 \left(\begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right) \left(\begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right) + 3H_{2} \left(\begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right) + 4H_{2}O \left(\begin{array}{c} \\ \\ \\ \\ \end{array} \right)$$

(2)
$$+ \text{Ni}(C_2H_3O_2)_2*4H_2O \text{ (aq)}$$

$$+ 2 H^* \text{ (aq)} + 4H_2O \text{ (l)}$$

$$+ 2 C_2I_3O_2 \text{ (aq)}$$

Experimental:

Synthesis of tetraphenylporphyrin

A 250mL round-bottomed flask containing 2.5mL pyrrole (0.036 mol), 3.6mL benzaldehyde (0.0356 mol), and 135mL of propionic acid was fitted with a reflux condenser and gently reflux dondensed for 30 minutes. The flask and its contents were were added +

He mixture was heated to