Consider the reaction: $NH_2COONH_4\ (s) \rightleftharpoons 2\ NH_3\ (g) + CO_2\ (g)$

At high temperatures such as 250.°C, the equilibrium constant for the reaction is $1.58 \times 10^{-8}$. A research student ran the experiment by first placing 39.1 g of the reactant compound in a 750. mL evacuated closed container. *(R = 0.08206 L.atm/K.mol; K = °C + 273; pay attention to sig figs)*

a. Write the equilibrium expression, $K_c$, for this reaction.

a. What is the concentration of each of the products at equilibrium?

$NH_2COONH_4\ (s) \rightleftharpoons$ **$2\ NH_3\ (g) + CO_2\ (g)$**

a. What is the pressure in atm exerted by each of the products at equilibrium?

a. Use these pressures to calculate the $K_p$ for the reaction at this temperature.

a. What is the total pressure in the container at equilibrium.

a. If the reaction was initially set up with 95.5 g of the reactant instead of the 39.1 g, and all other conditions were the same , what are the concentrations of each of the products at equilibrium?

a. If the reaction was carried out at 200°C instead, the concentrations of the ammonia and the carbon dioxide were lower than when the reaction was carried out 250°C. Use this information to determine if the reaction is endothermic or exothermic, and be sure I can follow your reasoning (try to be concise, please!).