Prelab Question – Experiment 2: Chemical Equilibrium, Week 1

On page 3/4 of the laboratory handout is the following example:

In a table, summarize your observations for each of the reactions that you perform on the iron-thiocyanate equilibrium. As an example, if you added a drop of concentrated HCl to the standard solution, the blood-red color lightens or perhaps disappears altogether. This change in color indicates that the $FeNCS^{2+}$ concentration decreases. To explain this result, it is necessary to know that in the presence of a large excess of Cl^-, Fe^{3+} forms complex ions:

$$Fe^{3+}(aq) + 6\ Cl^-(aq) \rightleftharpoons FeCl_6^{3-}(aq) \qquad (6)$$

The increase in Cl^- reduces the Fe^{3+} concentration, so in accord with Le Chatelier's Principle, some $FeNCS^{2+}$ dissociates to replace some of the Fe^{3+} removed by reaction with Cl^-. This result is summarized in the table as follows:

Stress	Observation	Reactions of Interest	Explanation
+1 drop HCl	sol'n turned yellow	$Fe^{3+} + 6\ Cl^- \rightleftharpoons FeCl_6^{3-}$ *and what other reaction? (see Week 1 prelab)*	Equilibrium shifted left in response to a decrease in $[Fe^{3+}]$ caused by reaction with Cl^-.

In the space below, write the relevant reaction of interest (italicized words above) that is coupled with the reaction of Fe^{3+} with Cl^-. Indicate the direction of the shift in equilibrium on the reaction.