When this chiral secondary alcohol reacts with SOCl₂ alone, retention of configuration via the S_Ni mechanism is observed from the initially formed intermediate. When SOCl₂ and pyridine are used, the initially formed intermediate reacts with pyridine to give an excellent leaving group and inversion of configuration is observed. When the SOCl₂ reaction is carried out in 1,4-dioxane, retention of configuration is also observed, but not via the S_Ni mechanism. Propose an alternative to the S_Ni mechanism under these conditions that could also lead to retention of configuration as the only outcome.

11.20 Complete the following equations as required.

- For the first reaction, retention of configuration but not by S_Ni … the other way (see CHEM 210) to get retention of configuration is by a double inversion reaction (two S_N2 reactions in sequence).