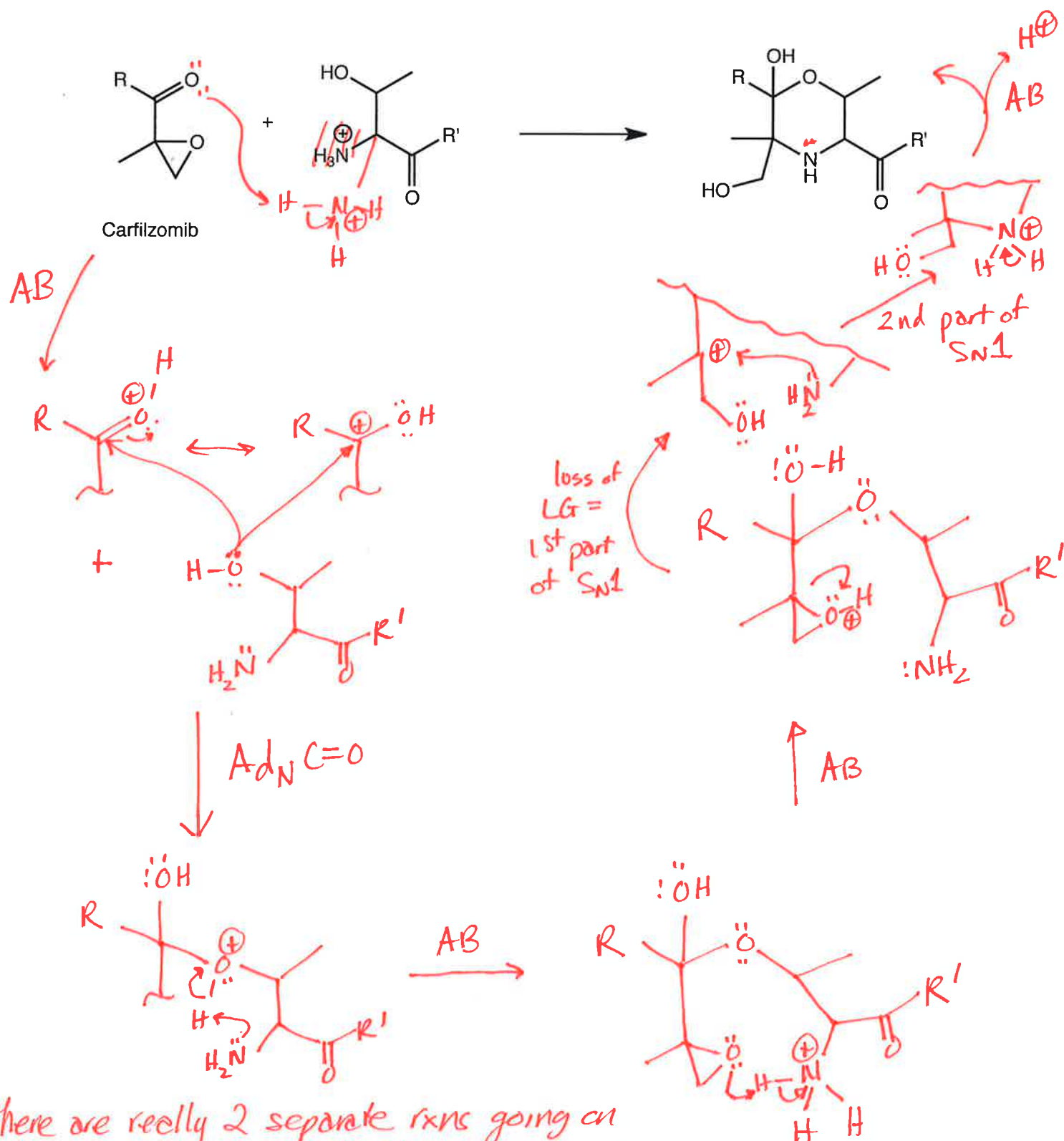


KEY

## Study Question 3e

After you complete the mechanisms requested below, label each step with the type of reaction occurring:  $Ad_E$ ,  $S_N1$ ,  $S_N2$ ,  $E1$ ,  $Ad_{Nu}C=O$  or  $AB$  (meaning acid-base or proton transfer).

Carfilzomib is a 20S proteasome inhibitor used to treat multiple myeloma. Carfilzomib reacts with a threonine on the proteasome as shown below. Draw a mechanism for this reaction.



there are really 2 separate rxns going on here, and you could do them in any order.

