If, in a reaction, stereoisomeric (see stereoisomers) reactants gives stereoisomeric products, the reaction is said to be stereospecific.

**eg. 1:**

Reactions 1 and 2 are \( S_N^2 \) reactions of stereoisomeric substrates \( 1 \) and \( 2 \) with the same nucleophile, leading to stereoisomeric substitution products \( 3 \) and \( 4 \), respectively. Thus, \( S_N^2 \) reactions are stereospecific.

**eg. 2:**

Reactions 3 and 4 are Diels-Alder reactions of stereoisomeric dienophiles \( 5 \) and \( 6 \) with the same diene, 1,3-butadiene. The products of the reaction of \( 5 \) is \( 7 \); the products of the reaction of \( 6 \) are \( 8 \) and \( 9 \). \( 7 \) and \( 8 \) are stereoisomers, so are \( 7 \) and \( 9 \). Thus, Diels-Alder reactions are stereospecific.

**Contributors and Attributions**

- Gamini Gunawardena from the OChemPal site (Utah Valley University)