

Question#12067

Based on periodic trends, which would be a better nucleophile in S_N2 reactions, NH_3 or H_2O ?

- a. H_2O
- b. neither NH_3 nor H_2O can act as nucleophiles
- c. both would be equally effective
- d. NH_3

Answer:

Nucleophile means "nucleus loving" which describes the tendency of an electron rich species to be attracted to the positive nuclear charge of an electron poor species, the electrophile .

Here is a table of relative nucleophilicities

Very Good I^- , HS^- , RS^-

Good Br^- , HO^- , RO^- , NC^- , N_3^-

Fair NH_3 , Cl^- , F^- , RCO_2^-

Weak H_2O , ROH

Very Weak RCO_2H

That's why:

- d. NH_3