Question #57836, Chemistry / Organic Chemistry |

Treatment of alkyl halides with alcoholic AGNO2 give mainly nitroalkanes . explain its please.

Answer:

This reaction consists of two steps:

1) Dissociation of alkyl halides and $AgNO_2$:

$R\text{-}Hal \rightarrow R^+ + Hal^-$

$AgNO_2 \rightarrow Ag^+ + NO_2^-$

2) Produced carbocation(R^+) reacts with NO_2^- and Hal^- forms precipitate with Ag^+:

$R^+ + NO_2^- \rightarrow R\text{-}NO_2$

$Ag^+ + Hal^- \rightarrow AgHal$

It should be noted that only alkyl bromides and iodides give good yields, primary chlorides fail to react. It is conditioned by the weaker C-Hal bond in case of Br and, especially, I, which favors formation of a carbocation which easily reacts with NO_2-.