

Using only methane and ethane, and any inorganic reagents you wish, synthesize $\text{CH}_3\text{OCH}_2\text{CH}_3$ (methyl ethyl ether.) Hint: The reactions you will need are:

1. light catalyzed halogenations
2. acid-base reaction involving strong base removing proton from weaker base
3. $\text{S}_{\text{N}}2$ displacements

