

S_N2 Reactions- Give the product for each reaction. Do not peek at the answers until you have a reasonable solution. Answers are shown below.

$\text{CH}_3\text{---CH}_2\text{---CH}_2\text{---Cl}$	$\text{Na}^+ \begin{array}{c} \text{:O}^- \\ \text{ } \\ \text{OCH}_3 \end{array} \xrightarrow[\text{(solvent)}]{\text{acetone}}$	
	$\text{Na}^+ \begin{array}{c} \text{:O}^- \\ \text{ } \\ \text{OCH}_2\text{CH}_3 \end{array} \xrightarrow{\text{acetone}}$	
$\text{CH}_3\text{---CH}_2\text{---CH}_2\text{---Br}$	$\text{Na}^+ \begin{array}{c} \text{:C}\equiv\text{N:} \\ \text{ } \end{array} \xrightarrow[\text{(solvent)}]{\text{DMF}}$	
	$\text{Na}^+ \begin{array}{c} \text{:O}^- \\ \text{ } \\ \text{OCH}_3 \end{array} \xrightarrow{\text{acetone}}$	
	$\xrightarrow[\text{DMF}]{\text{NaOEt}}$	
	$\xrightarrow{\text{acetone}}$	
	$\xrightarrow[\text{DMF}]{\text{KCN}}$	
	$\xrightarrow[\text{acetone}]{\text{NaH}}$	
	$\xrightarrow[\text{acetone}]{\text{NaH}}$	
$\text{CH}_3\text{---CH}_2\text{---CH}_2\text{---}\begin{array}{c} \text{O} \\ \text{ } \\ \text{S} \\ \text{ } \\ \text{O} \end{array}\text{---CH}_3$	$\xrightarrow[\text{CH}_3\text{CN}]{\text{NaOH}}$	
	$\xrightarrow[\text{(solvent)}]{\text{CH}_3\text{CN, KCN}}$	

S_N2 Reactions- Give the product for each reaction. Do not peek at the answers until you have a reasonable solution. Answers are shown below.

	$\xrightarrow[\text{EtOH}]{\text{NaOEt}}$	
	$\xrightarrow[\text{DMF}]{\text{NaO}} \text{CH}_3\text{--CH}_2\text{--CH}_2\text{--Br}$	
$\text{CH}_3\text{--CH}_2\text{--CH}_2\text{--Br}$	$\xrightarrow{\text{acetone}} \text{O}^- \text{O}=\text{C}(\text{CH}_3)$	
	$\xrightarrow{\text{DMF}} \text{C}(\text{CH}_3)\equiv\text{C}^- \text{CH}_3$	
	$\xrightarrow[\text{(solvent)}]{\text{DMSO}} \text{NaSH}$	
	$\xrightarrow{\text{DMSO}} \text{NaSCH}_3$	
	$\xrightarrow{\text{DMF}} :\text{NH}_3$	
	$\xrightarrow{\text{DMF}} :\text{NH}_2\text{CH}_3$	
	$\xrightarrow{\text{DMSO}} :\text{P}(\text{CH}_3)_3$	
	$\xrightarrow[\text{DMF}]{:\text{NH}(\text{CH}_2\text{CH}_3)_2}$	
	$\xrightarrow{\text{DMSO}} \text{C}_6\text{H}_5\text{--P}(\text{Ph})_3$	

ANSWER KEY

$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Cl}$	$\text{Na}^+ \text{:}\ddot{\text{O}}\text{CH}_3^-$ acetone (solvent)	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OCH}_3$
	$\text{Na}^+ \text{:}\ddot{\text{O}}\text{CH}_2\text{CH}_3^-$ acetone	
$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Br}$	$\text{Na}^+ :\ddot{\text{C}}\equiv\text{N}\cdot$ DMF (solvent)	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-C}\equiv\text{N}\cdot$
	$\text{Na}^+ \text{:}\ddot{\text{O}}\text{CH}_3^-$ acetone	
	NaOEt DMF	
$\text{CH}_3\text{CH}_2\text{Br}$	acetone	
	KCN DMF	
$\text{HOCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$	NaH acetone	
$\text{HOCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$	NaH acetone	
$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-}\ddot{\text{O}}\text{S(=O)(=O)CH}_3$	NaOH CH_3CN	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} + \text{Na}^+ \text{:}\ddot{\text{O}}\text{S(=O)(=O)CH}_3^-$
$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-SO}_3\text{CH}_3$	KCN CH_3CN (solvent)	

ANSWER KEY

	$\xrightarrow[\text{EtOH}]{\text{NaOEt}}$	
	$\xrightarrow[\text{DMF}]{\text{NaO-C}_2\text{H}_5}$	
$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$	$\xrightarrow{\text{acetone}} \text{O}^- \text{C}(=\text{O})\text{CH}_3$	$\text{CH}_3\text{CH}_2\text{CH}_2\text{O}=\text{C}(=\text{O})\text{CH}_3$
	$\xrightarrow[\text{DMF}]{\text{C}\equiv\text{C}-\text{CH}_3^-}$	
	$\xrightarrow[\text{(solvent)}]{\text{NaSH, DMSO}}$	
	$\xrightarrow[\text{DMSO}]{\text{NaSCH}_3}$	
	$\xrightarrow[\text{DMF}]{\text{:NH}_3}$	
	$\xrightarrow[\text{DMF}]{\text{:NH}_2\text{CH}_3}$	
	$\xrightarrow[\text{DMSO}]{\text{:P(CH}_3)_3}$	
	$\xrightarrow[\text{DMF}]{\text{:NH(CH}_2\text{CH}_3)_2}$	
	$\xrightarrow[\text{DMSO}]{\text{Ph}_3\text{P}(\text{OEt})_2}$	