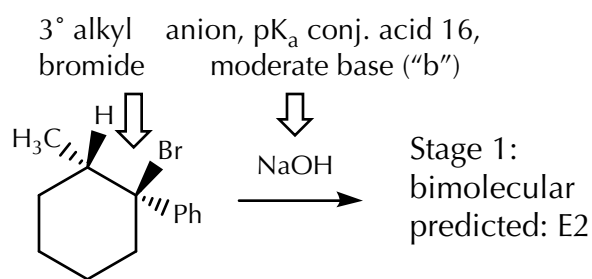


Example C



i. Is there (or is there the potential for) an sp³ carbon-leaving group?

yes	yes, potential	no
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ii. If so, what is the structural category for the carbon atom?

1°	2°	3°	heteroatom-substituted
allylic		benzylic	propargylic

iii. If there is a Lewis base, what is its classification?

anion, conj. acid pK _a < 15 uncharged sp ³ N, S, or P	anion, conj. acid pK _a 15-30	conj. acid pK _a > 30, hindered base conj. acid pK _a > 10	poor electron donor (not in the other categories)
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iv. Is a bimolecular reaction predicted? If so, which one?

S _N 2	E2	no bimolecular
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v. If no bimolecular, then is there:

good carbocation possible	polar solvent
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vi. Is S_N1/E1 predicted?

yes	no
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	category a good e donor weak base Lewis base sp ³ C-LG	category b good e donor moderate base	category c good e donor strong base	category d poor e donor weak base
1° C	S _N 2	S _N 2	E2 (no β-H: S _N 2)	no bimolecular predicted
2° C	S _N 2	E2 (no β-H: S _N 2)	E2 (β-H)	
3° C	no S _N 2; no E2	E2 (β-H)	E2 (β-H)	

The original version was marked as 2° not 3° (although it does not change the outcome).

The Lewis base (hydroxide) is an anion. The conjugate acid of hydroxide is water, with its pK_a value of about 16; this places **hydroxide** in the category of being a good electron donor that is also a moderate base for substitution and elimination reactions.