

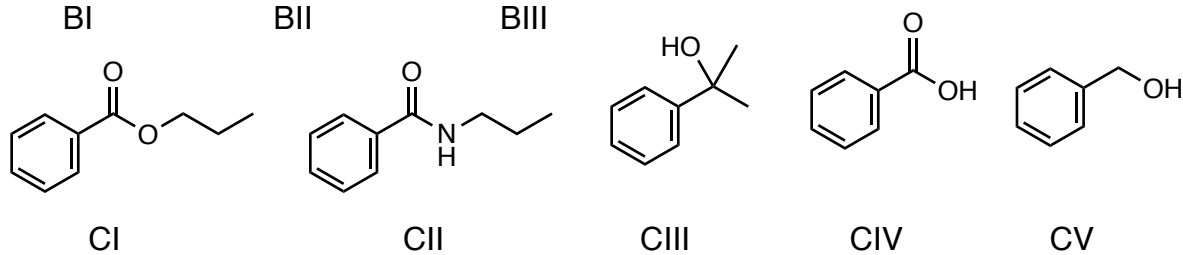
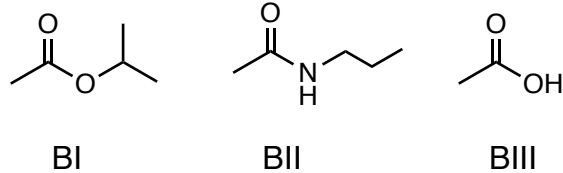
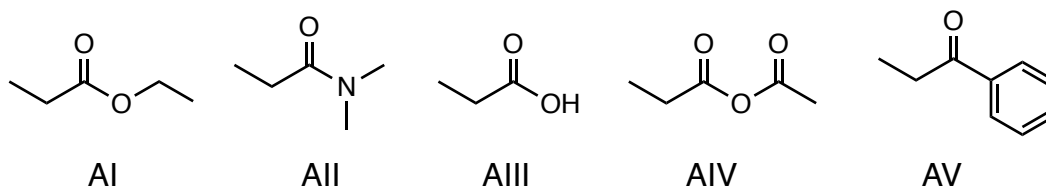
Chapter 21 Acid Derivatives Practice Problems

Solutions

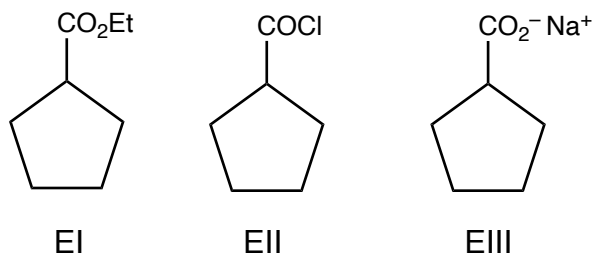
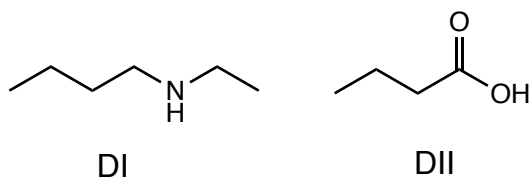
- 1
- | | |
|------------------------------|---|
| A. 3-methylhexanoic acid | D. isopropyl 3-methylhexanoate |
| B. 3-methylhexanoyl chloride | E. 3-methylhexanamide |
| C. methyl 3-methylhexanoate | F. <i>N</i> -ethyl 3-methylhexanamide |
| | G. <i>N</i> -ethyl, <i>N</i> -methyl 3-methylhexanamide |

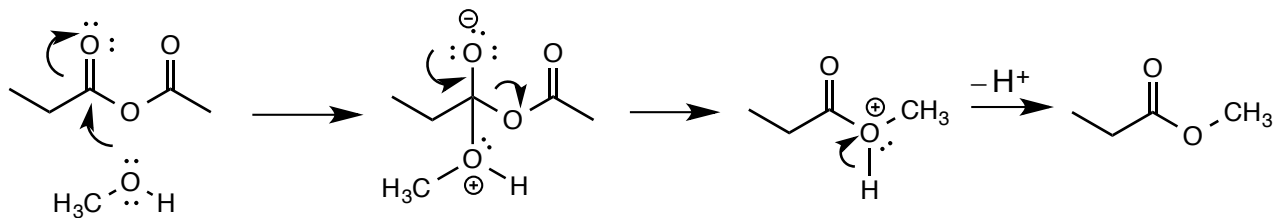
- 2
- | | |
|--|--|
| A. benzoyl chloride | D. 3-methylbutanoic anhydride |
| B. ethyl 2-bromopentanoate | E. 3-bromo-3-methylpentanoic acid |
| C. <i>N</i> -ethyl 3-methylpentanamide | F. 3-nitrobenzoic acid (or meta-nitrobenzoic acid) |

- 3
- | | |
|---------------------------------------|----------------------------|
| A. 4-bromobutanoic acid | F. 3-methyl pentanamide |
| B. 4-bromobutanoyl chloride | G. ethyl benzoate |
| C. ethyl 4-bromobutanoate | H. phenyl propanoate |
| D. <i>N</i> -methyl 4-bromobutanamide | I. 4,4-dimethylpentanal |
| E. 3,3-dimethylpentanoyl chloride | J. methyl 2-ethylbutanoate |



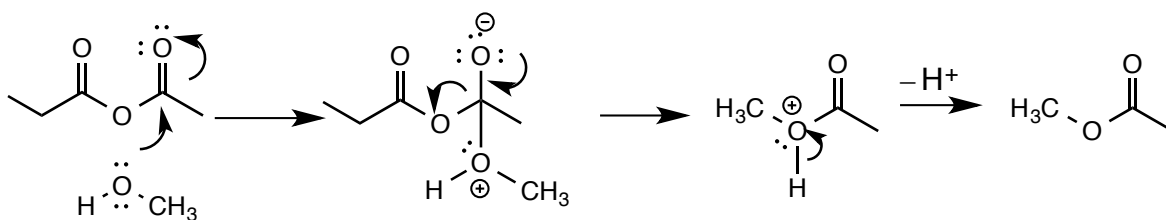
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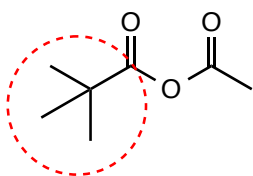
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OR

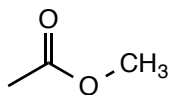


• Both carbonyl groups of the anhydride are subject to attack by the methanol nucleophile

6

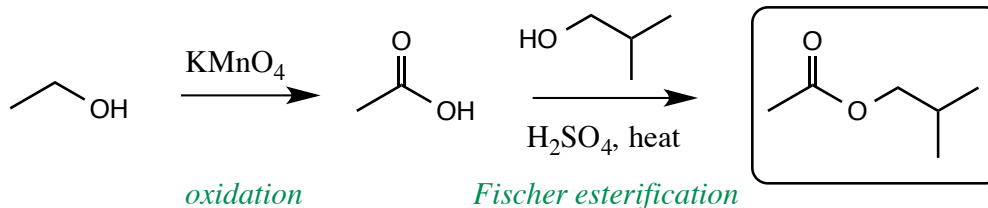


• steric hindrance created by the large tert-butyl group is sufficient to deflect attack at the nearby carbonyl by the methanol nucleophile
 • thus, although theoretically two products would be possible, attack only occurs at the less sterically hindered carbonyl site leading to a single product

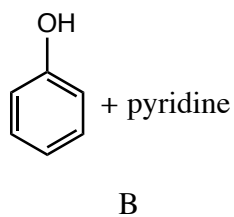
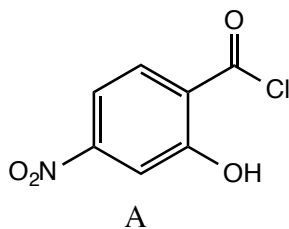


only product

7



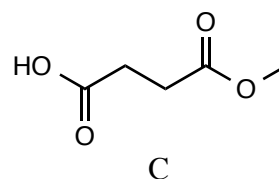
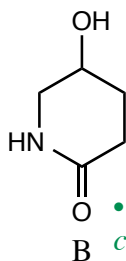
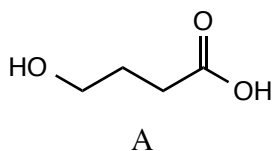
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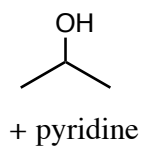
Sn⁰ or Fe⁰ or Zn⁰
HCl

C

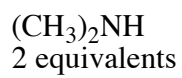
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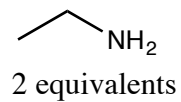
• NaBH₄ cannot reduce the amide carbonyl, but it can reduce the ketone carbonyl



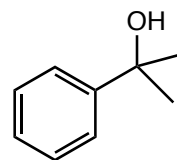
A



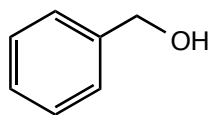
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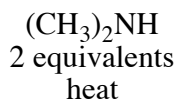
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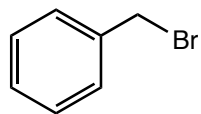
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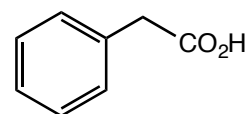
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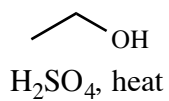
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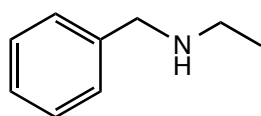
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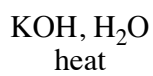
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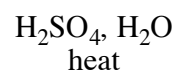
I



J



K



L



M