

[1] Answer the name of the reagent in the order of steps, used for the synthesis of 2-phenyl-1-ethylamine from the compounds below.

以下の化合物それぞれから 2-phenyl-1-ethylamine を合成するための試薬を、反応の順に答えよ。

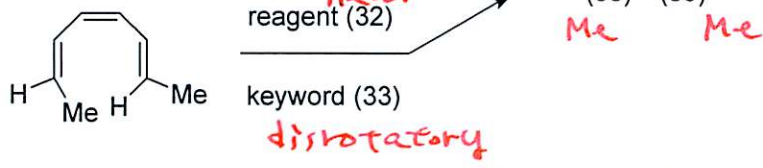
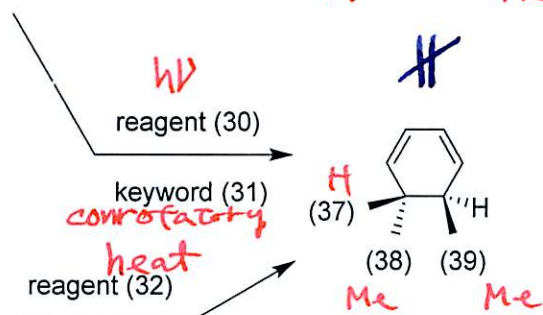
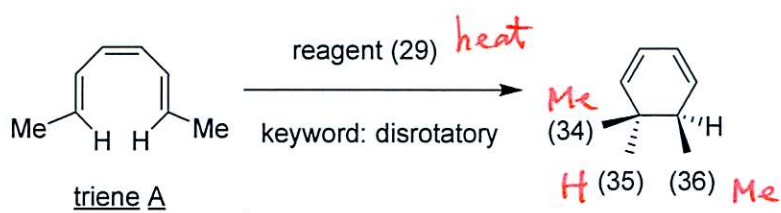
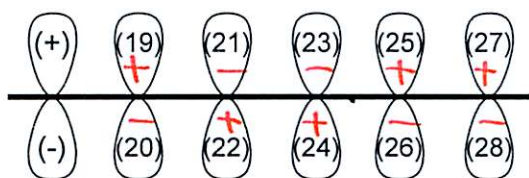
- benzyl bromide (2 steps, 3 reagents) / / *NaCN / LAH / H₃O⁺*
- 2-phenylacetic acid (3 steps, 4 reagents) / / / *SOCl₂ / NH₃ / LAH / H₃O⁺*
- (2-bromoethyl)benzene (2 steps, 4 reagents) / / / *phthalimide / KOH / NaOH / H₂O*
- 2-phenylacetaldehyde (1 step, 2 reagents) / *NH₃ / NaBH₄*
- 3-phenylpropanamide (1 step, 3 reagents) / / *NaOH / Br₂ / H₂O*
- 3-phenylpropanoyl chloride (2 steps, 2 reagents) / *NaN₃ / H₂O*

Select the candidate below.

- (-) heat
- (±) phthalimide
- (0) NaCN
- (1) NaN₃
- (2) H₂O
- (3) H₃O⁺
- (4) Br₂
- (5) LiAlH₄
- (6) NaOH
- (7) KOH
- (8) SOCl₂
- (9) NH₃

[2] Answer the HOMO for the ground state of triene A by (+) or (-) signs. Answer reagents, keywords, and the substituent in the product, for the reactions below.

トリエン A の基底状態 HOMO を (+)(-) の符号で答えよ。下記の反応における試薬とキーワード、生成物の置換基を答えよ。

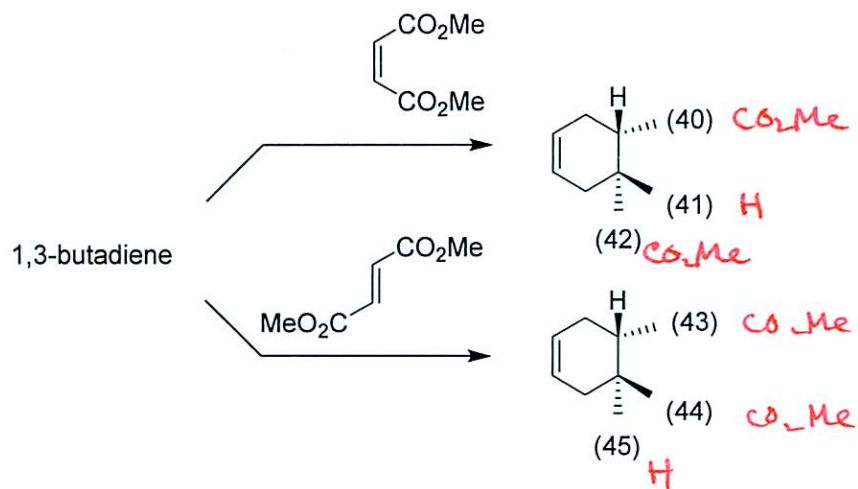


Select the candidate below.

- (-) heat
- (±) hv
- (0) conrotatory
- (1) disrotatory
- (2) H
- (3) Me
- (4) (+)
- (5) (-)

[3] Answer the substituent in the product.

生成物の置換基を答えよ。



Select the candidate below.

(-) H

(±) CO₂Me

[4] Answer the name of the reagent in the order of steps, used for the synthesis of the compounds below from propionic acid.

Propionic acid から以下の化合物を合成するための試薬を、反応の順に答えよ

- 1-propanol (1 step, 2 reagents) / LAH / H₃O⁺
- propanal (1 step, 2 reagents) / DIBAL / H₃O⁺
- butyronitrile (3 steps, 4 reagents) / / /
LAH / H₃O⁺ / PBr₃ / NaCN
- propylbenzene (3 steps, 5 reagents) / / / /
LAH / H₃O⁺ / PBr₃ / AlCl₃ / PhH
- propionitrile (3 steps, 3 reagents) / /
SOCl₂ / NH₃ / SOCl₂
- 1-propene (3 steps, 4 reagents) / / /
LAH / H₃O⁺ / PBr₃ / KOH

Select the candidate below.

- (-) hexane
- (±) benzene
- (0) PBr₃
- (1) NaCN
- (2) H₃O⁺
- (3) AlCl₃
- (4) DIBAL
- (5) LiAlH₄
- (6) KOH
- (7) H₂O
- (8) SOCl₂
- (9) NH₃

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You may answer the question [5] below, for additional scores

自由回答

[5] Draw the mechanism of Fischer esterification of acetic acid and ethanol using sulfuric acid, on the backside of the answer sheet.

硫酸による、酢酸とエタノールの Fischer エステル化のメカニズムを解答用紙の裏に書

