

**Giuseppe Valitutti – Gabriella Fornari – Maria Teresa Gando**  
**Chimica organica, biochimica e laboratorio**  
***Soluzioni degli esercizi del testo***

**Capitolo 10**

**10.14** 2 > 1 > 3

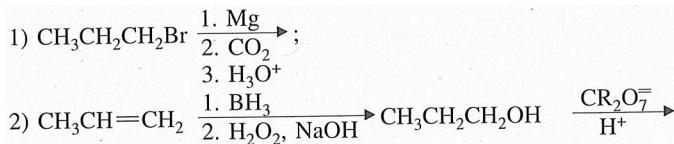
**10.15** Acido 2,2-diclorobutanoico > 2-cloropropanoico > 3-cloropropanoico > propanoico

**10.16** Acido 4-nitrobenzoico > 4-bromobenzoico > benzoico > 4-metossibenzoico

**10.17** 1) acido butanoico; 2) acido pentanoico; 3) acido butanoico.

**10.18** Prima si nitra il toluene con  $\text{HNO}_3$  e  $\text{H}_2\text{SO}_4$ . Successivamente si ossida con  $\text{KMnO}_4$  e  $\text{H}_2\text{SO}_4$ .

**10.19**



**10.20** 1)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3$ ; 2)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}(\text{CH}_3)_2$ ; 3)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}(\text{CH}_3)_2$ ; 4)  $\text{C}_6\text{H}_5\text{COOCH}_2\text{C}_6\text{H}_5$ ; 5)  $\text{C}_6\text{H}_5\text{CO}-\text{O}-\text{COC}_6\text{H}_5$ .

**10.23** d).

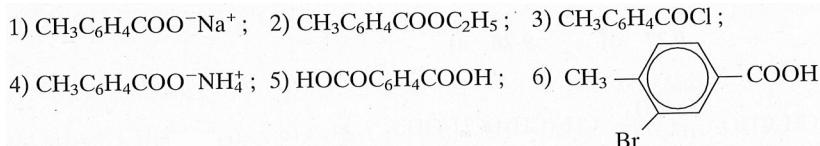
**10.24** b).

**10.25** c).

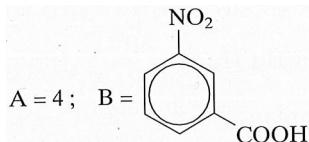
**10.26** 4 > 1 > 2 > 3

**10.27** a).

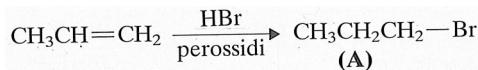
**10.28**



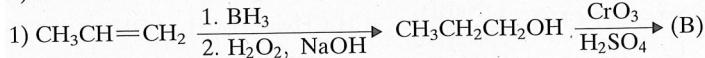
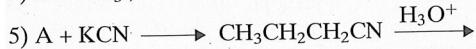
**10.29**



**10.30**



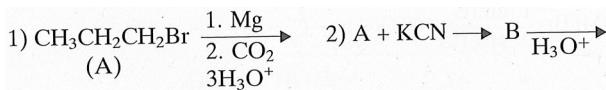
2) A + NH<sub>3</sub>;



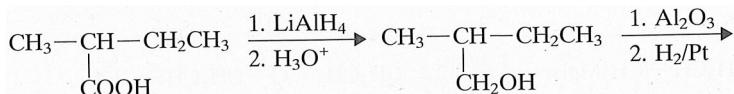
3) B + PCl<sub>5</sub> —→ (C)

4) C + NH<sub>3</sub>

**10.31**

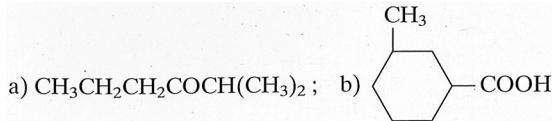


**10.32**



**10.33** C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>COOH.

**10.34**

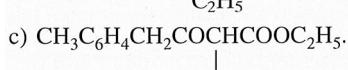
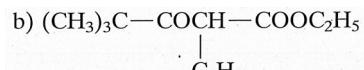


**10.36** Toluene → ac. benzoico → cloruro di benzoile → benzofenone, C<sub>6</sub>H<sub>5</sub>COC<sub>6</sub>H<sub>5</sub>

**10.37** A: C<sub>6</sub>H<sub>5</sub>Cl; B: C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>OH; C: C<sub>6</sub>H<sub>5</sub>CHO; D: C<sub>6</sub>H<sub>5</sub>COOH.

**10.38** d > b > c > a > e

**10.39**



Meccanismo della condensazione di Claisen.