

# Chemistry 2542, Fall 2016

## Quiz 4

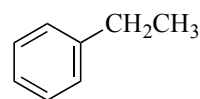
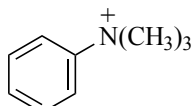
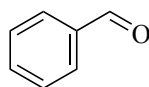
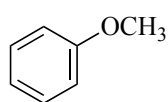
(30 points)

### Important notes:

- Please use the provided Scantron form for your answers; you can keep the sheet with the questions and can use it as scratch paper
- Do not forget to write your name on the Scantron form
- You will not receive credit for unmarked answers or for more than one mark on answer line
- Your scores will be posted on eGradebook; graded Scantron forms will not be returned to students.

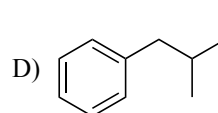
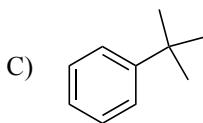
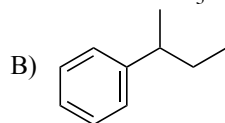
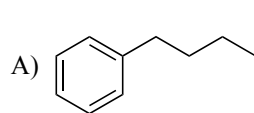
**Questions 1-10: Please mark the appropriate box on the front of the Scantron form (3 pts each).**

1. Arrange the following compounds according to **decreasing order of reactivity** in an electrophilic aromatic substitution reaction.

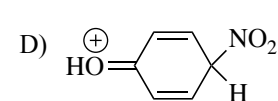
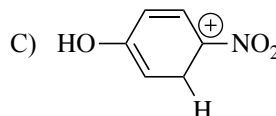
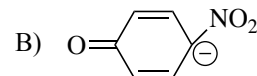
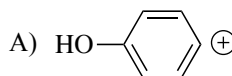
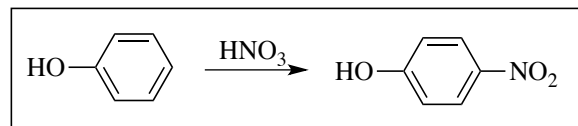


A) 1 (most reactive) > 4 > 2 > 3    B) 4 > 1 > 2 > 3    C) 2 > 3 > 4 > 1    D) 3 > 4 > 2 > 1

2. Which of the following compounds is a product formed by a **1,2-hydride shift** in the reaction of benzene with 1-chlorobutane and  $\text{AlCl}_3$ ?



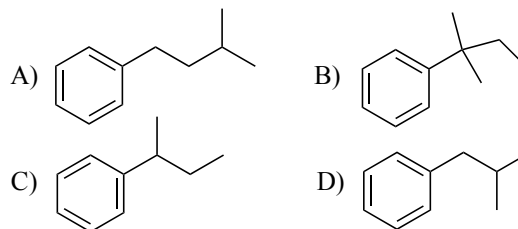
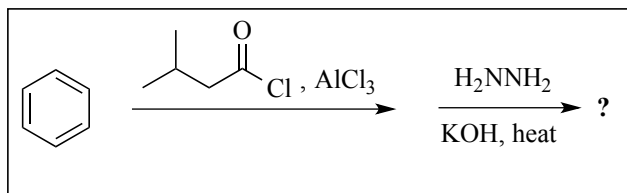
3. Which of the following is a key **intermediate** for the transformation in the box?



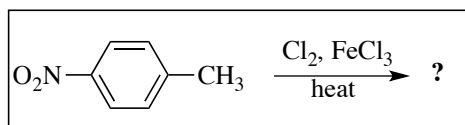
4. Which one of the following groups will be **meta-directing** in the electrophilic aromatic substitution reaction?

A)  $-\text{F}$     B)  $-\text{N}(\text{CH}_3)_2$     C)  $-\text{SH}$     D)  $-\text{CF}_3$

5. What is a major **product** of the following sequence of reactions?

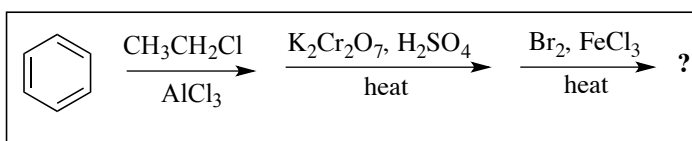


6. What is the name of the **product** formed in the following reaction?



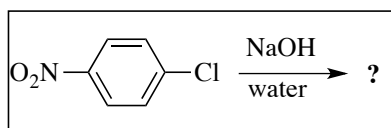
- A) 2-chloro-4-nitrotoluene    B) 3-chloro-4-methylaniline  
C) 2-chloro-4-nitrophenol    D) *p*-chlorotoluene

7. What is the name of the **product** formed in the following sequence of reactions?



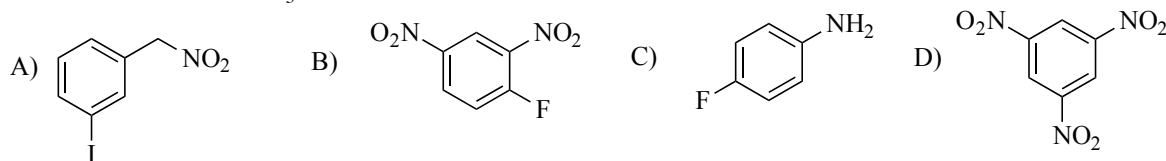
- A) *m*-bromobenzoic acid    B) *p*-bromobenzoic acid  
C) *m*-bromoethylbenzene    D) *p*-bromoethylbenzene

8. What is the name of the major **product** of the reaction shown in the box?

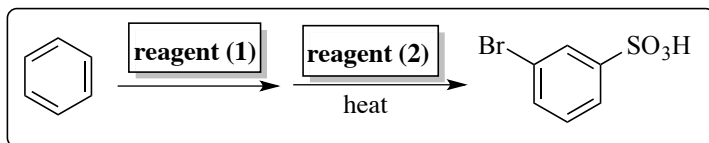


- A) *m*-chlorophenol    B) *p*-chlorophenol  
C) *p*-nitrophenol    D) *m*-nitrophenol

9. Which one of the following compounds is most reactive towards **nucleophilic aromatic substitution** reaction with NaOCH<sub>3</sub>?



10. Which **reagents** can be used for the sequence of reactions shown in the box?



- A) (1) SO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, (2) Br<sub>2</sub>, FeBr<sub>3</sub>  
B) (1) Br<sub>2</sub>, FeBr<sub>3</sub>, (2) SO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>  
C) (1) NBS, light, (2) H<sub>2</sub>SO<sub>4</sub>  
D) (1) H<sub>2</sub>SO<sub>4</sub>, (2) NBS, light