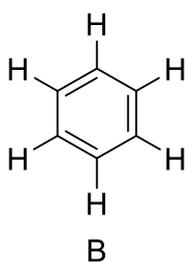
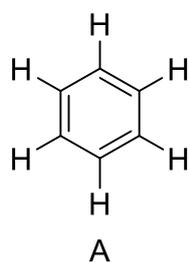


### Ⅲ. 공명구조: Resonance Structure

1. Lewis Structure와 Resonance의 필요성
2. 다양한 Resonance의 사례들
3. Resonance Structure의 평가
4. 주의사항!

#### 1. Lewis Structure와 Resonance의 필요성

(1) C<sub>6</sub>H<sub>6</sub>의 구조분석 (Benzene ring)



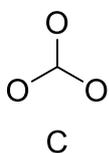
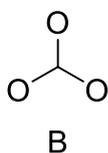
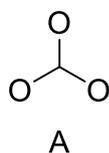
i) 두 구조의 모든 원자들의 형식전하가 올바르게 표시되어 있는지 확인한다.

ii) 어느 구조가 올바른 Lewis Structure일까?

정답:

(2) Carbonate의 구조분석 (CO<sub>3</sub><sup>2-</sup>)

CO<sub>3</sub><sup>2-</sup>의 최외각 전자수는 모두 \_\_\_\_\_개이다. 따라서 분자 내에 \_\_\_\_\_개의 (-) 형식전하가 나타나야 한다.



좌측의 세 Lewis Structure는 모두 올바르다.  
(올바른 형태로 완성하시오.)

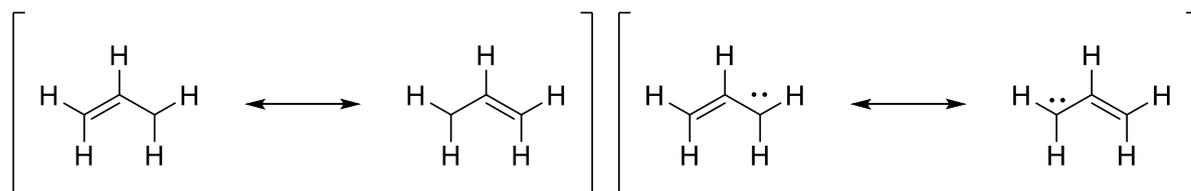
#### 2. 다양한 Resonance Structure

(1) Resonance Structure를 만드는 방법

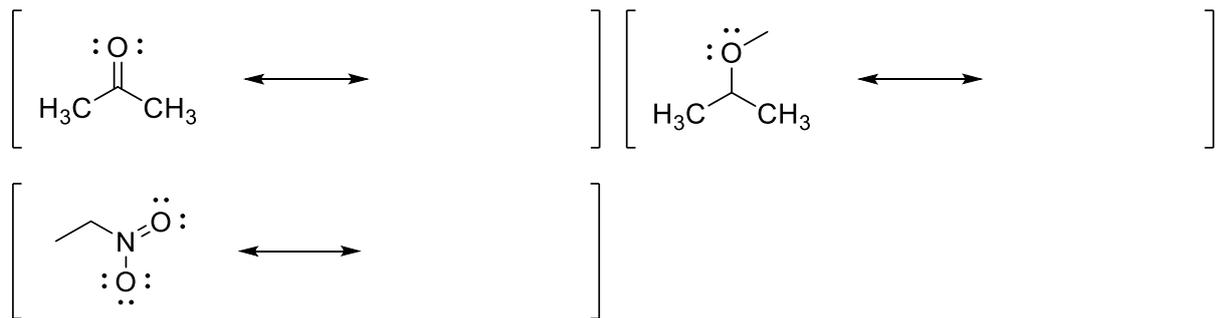
- i) 비공유전자쌍이나 다중결합에서 시작한다.
- ii) 전자쌍을 통째로 움직인다. (Electron pushing을 활용한다.)
- iii)

(2) 예시들

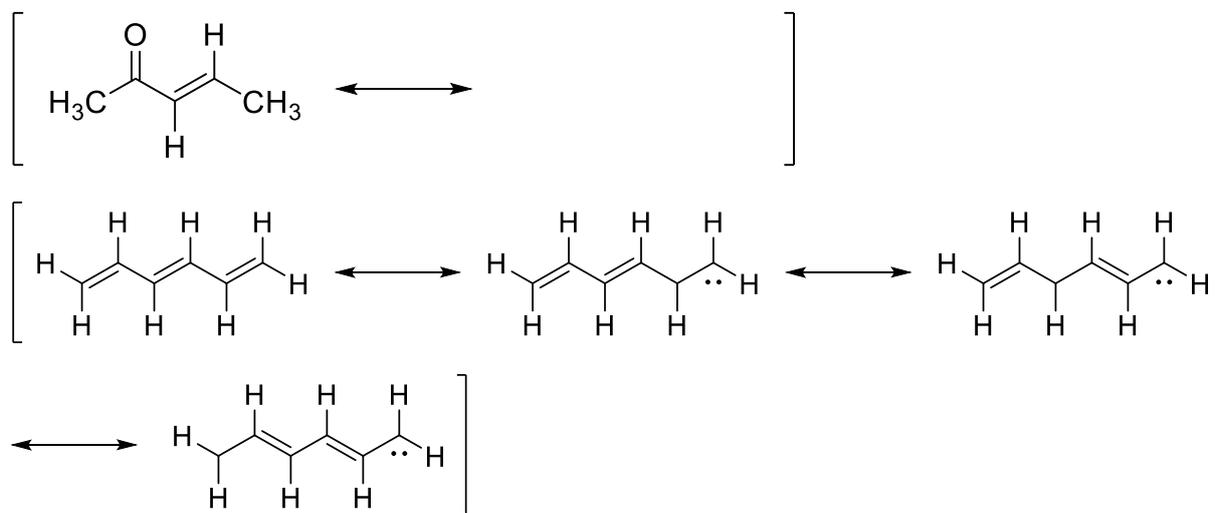
① Allyl System



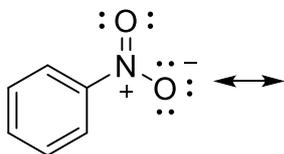
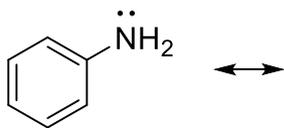
② Carbonyl group과 Nitro group



③  $\alpha,\beta$ -unsaturated system + conjugation system

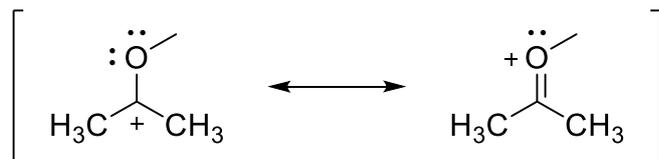


④ Benzene에 치환기가 달린 경우

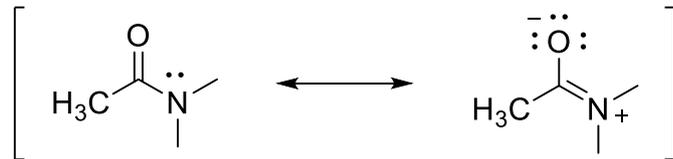
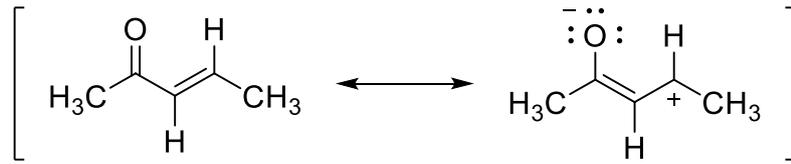


### 3. Resonance의 평가

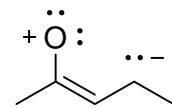
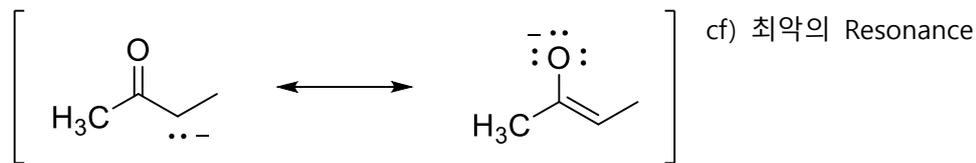
(1) Octet rule을 만족할 것



(2) 전하를 분리하지 말 것

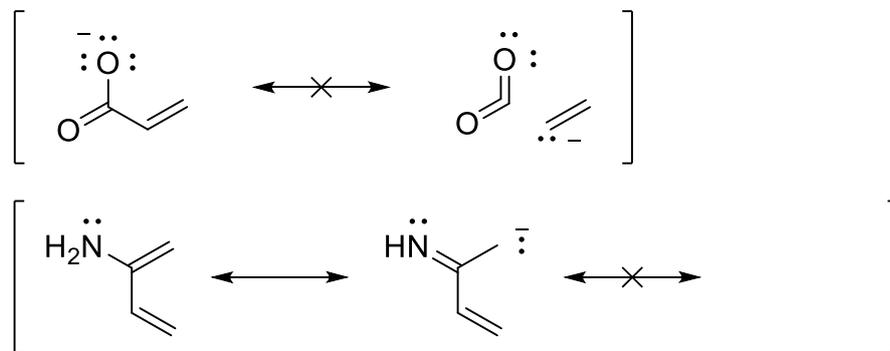


(3) 전기음성적인 원자에 (-) Charge를 둘 것 ((+) charge를 두지 말 것!)

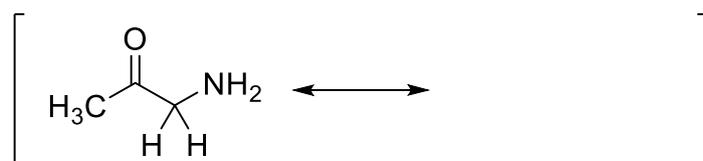
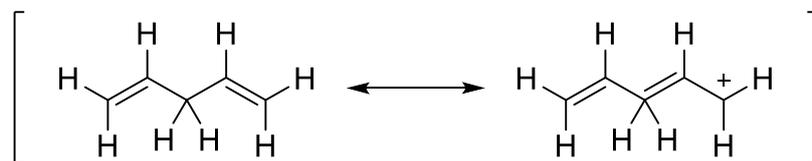


#### 4. 주의사항

(1)  $\sigma$  bond를 끊어서는 안 된다.



(2) Octet Rule 준수하기 (특히 2주기 원소)



(3) Resonance Structure는 서로 화학적 평형관계에 있는 것이 \_\_\_\_\_

Resonance Structure들을 각각 평가하여 그 기여도를 반영한 평균 값이 바로 \_\_\_\_\_이다.