

1) Conjugated Alkenes

Base value

a) Homocannular diene = 253 mm

b) Heterocannular diene = 215 mm

c) Butadiene, or cyclic conjugated diene = 217 mm

d) Alkyl substituent = 5

e) endo-cyclic double bond = 5

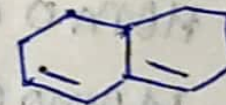
f) Double bond extending conjugation = 30

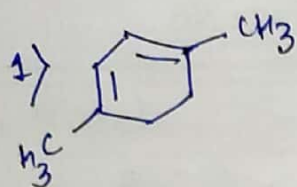
g) Strained molecule = 15

• Homocannular
→ 2 double
or conjugated
double bonds
in the same
ring



• Heterocannular
→ conjugated
double bonds
in diff. rings.





Homoannular diene = 253 nm

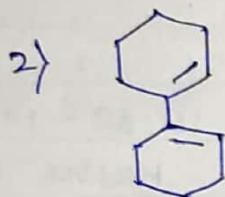
1 Alkyl substituent = 5

2 Alkyl substituent = $5 \times 3 = 15$

Total

$$= 253 + 15 \text{ nm}$$

$$= 268 \text{ nm } (\lambda_{\text{max}})$$

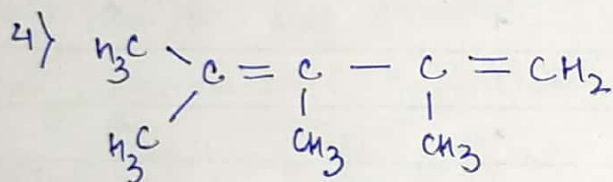


Heteroannular diene = 215 nm

4 Alkyl substituent = $4 \times 5 = 20$

Total

$$= 235 \text{ nm } (\lambda_{\text{max}})$$

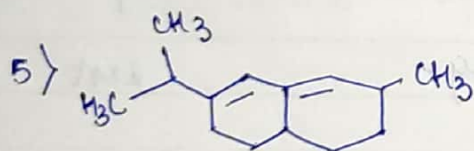


Butadiene, (Base value) = 217 nm

4 Alkyl substituent = $4 \times 5 = 20$

$$\text{Total} = 217 + 20 \text{ nm}$$

$$= 237 \text{ nm } (\lambda_{\text{max}})$$



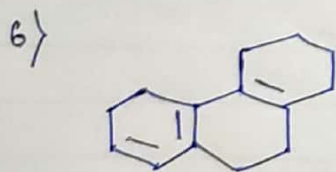
Heteroannular diene = 215 nm

3 Alkyl substituent = $3 \times 5 = 15$

Exo-cyclic double bond = 5

$$\text{Total } (\lambda_{\text{max}}) = 215 + 15 \text{ nm} + 5$$

$$= 230 \text{ nm} + 5 = 235 \text{ nm}$$



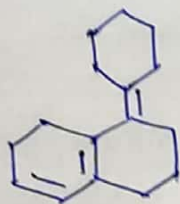
Homoannular diene = 253 nm

1 Double bond extending conjugation = 30

4 Alkyl substituent = $4 \times 5 = 20$

$$\lambda_{\text{max}} = 253 + 30 + 20 \text{ nm} = 303 \text{ nm}$$

7)



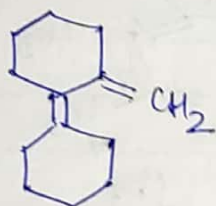
Homoannular diene. = 253 nm.

1 endocyclic double bond = 5

3 Alkyl substituents = $3 \times 5 = 15$

$$\lambda_{max} = 253 + 5 + 15 \text{ nm} = 273 \text{ nm}$$

8)



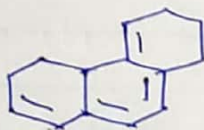
Butadiene = 217 nm

4 Alkyl substituent = $4 \times 5 = 20$

2 endocyclic double bond. = $2 \times 5 = 10$

$$\lambda_{max} = 217 + 20 + 10 = 247 \text{ nm}$$

9)



Homoannular diene = 253 nm.

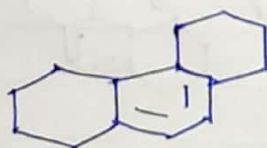
2 double bond extending conjugations = $30 + 30 = 60$

2 endocyclic double bond. = $2 \times 5 = 10$

4 Alkyl substituents = $4 \times 5 = 20$

$$\lambda_{max} = 253 + 60 + 10 + 20 = 343 \text{ nm}.$$

10)



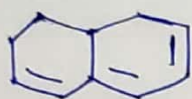
Homoannular diene = 253 nm.

4 Alkyl substituent = $4 \times 5 = 20$

2 endocyclic double bond = $2 \times 5 = 10$

$$\lambda_{max} = 253 + 20 + 10 = 283 \text{ nm}$$

11)



Homoannular diene = 253 nm

1 endo cyclic double bond = 5

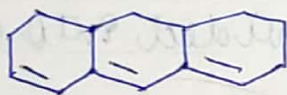
3 Alkyl substituent = $3 \times 5 = 15$

1 double bond extending conjugation = 30

$$\lambda_{max} = 253 + 5 + 15 + 30$$

$$= 303 \text{ nm}$$

12)



Heteroannular diene = 215 nm

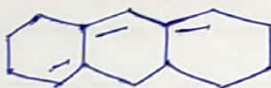
4 Alkyl substituents = $4 \times 5 = 20$ 2 endo cyclic double bonds = $2 \times 5 = 10$

1 double bond extending conjugation = 30

$$\lambda_{max} = 215 + 20 + 10 + 30 \text{ nm}$$

$$= 275 \text{ nm}$$

13)



Heteroannular diene = 215 nm

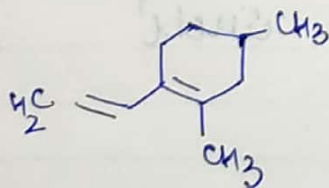
1 double bond extending conjugation = 30

5 Alkyl substituent = $5 \times 5 = 25$ 2 endo-cyclic double bond = $2 \times 5 = 10$

$$\lambda_{max} = 215 + 30 + 25 + 10 \text{ nm}$$

$$= 280 \text{ nm}$$

14)

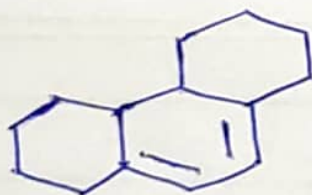


Butadiene system = 217 nm

3 Alkyl substituent = $3 \times 5 = 15$

$$\lambda_{max} = 217 + 15 \text{ nm} = 232 \text{ nm}$$

15)



Homocannular system = 253 nm
2 eno cyclic double bond = $2 \times 5 = 10$
4 Alkyl substituent = $4 \times 5 = 20$

$$\lambda_{\text{max}} = 253 + 10 + 20 \text{ nm} \\ = 283 \text{ nm.}$$