

February							2020	
S	M	T	W	T	F	S		
						1		
2	3	4	5	6	7	8		
9	10	11	12	13	14	15		
16	17	18	19	20	21	22		
23	24	25	26	27	28	29		

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Sem-6
cc-14 (class-3)

5th Week • 029-337

JANUARY
Wednesday

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We know, Rotational energy in

terms of wave number ($\frac{1}{\lambda}$)

$$\bar{\nu} = \frac{1}{\lambda} = B J(J+1) \text{ cm}^{-1} \dots (13)$$

where $B = \frac{h}{8\pi^2 I c}$ = Rotational

constant.

putting the value of $J = 0, 1, 2, 3$ we get

$$\text{When, } J = 0, \bar{\nu} = 0$$

$$J = 1, \bar{\nu} = 2B$$

$$J = 2, \bar{\nu} = 6B$$

$$J = 3, \bar{\nu} = 12B$$

$$J = 4, \bar{\nu} = 20B$$

$$J = 5, \bar{\nu} = 30B$$

$$J = 6, \bar{\nu} = 42B$$

January						
S	M	T	W	T	F	S
			1	2		
5	6	7	8	9		
12	13	14	15	16		
19	20	21	22	23		
26	27	28	29	30		

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5th Week • 030-336
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 Thursday

The allowed rotational energy level diagram is given below

For a rigid diatomic molecule

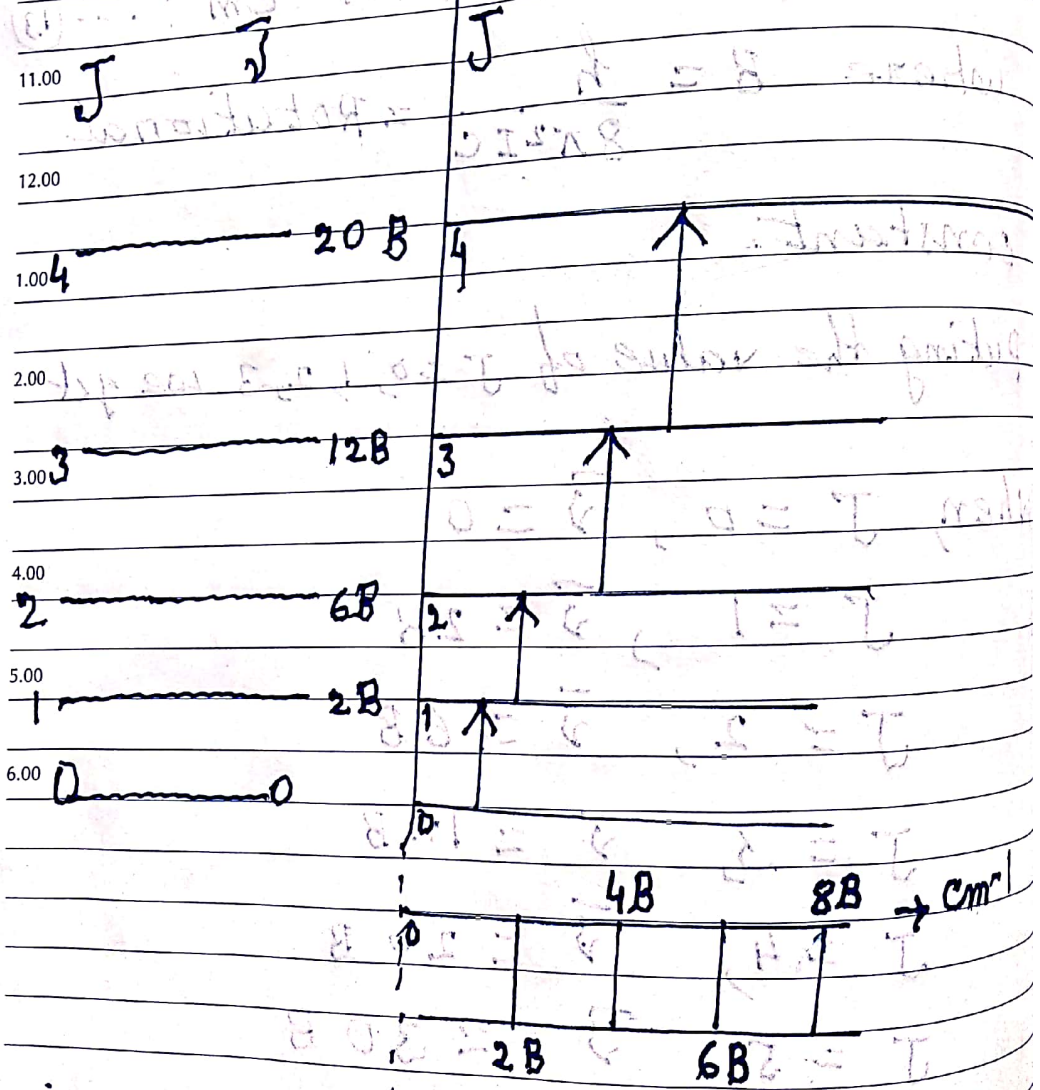


Fig-1

Fig-2

NOTES

February							2020	
S	M	T	W	T	F	S		
							1	
2	3	4	5	6	7	8		
9	10	11	12	13	14	15		
16	17	18	19	20	21	22		
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5th Week • 031-335

JANUARY

Friday

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Fig-1: The allowed rotational

energy levels of a rigid diatomic

molecule.

Fig-2 Allowed transitions between

the energy levels of a rigid

diatomic molecule and the

spectrum which arises from them.