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| JEE MAIN-2021 | DATE : 20-07-2021 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

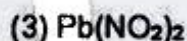
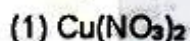
Sol. $(E_{\text{He}^+})_{n=2} = -13.6 \times \frac{(2)^2}{(2)^2} = -13.6 \text{ eV}$

$$(E_{\text{He}^+})_{n=3} = -13.6 \times \frac{(2)^2}{(3)^2} = -13.6 \times \frac{4}{9}$$

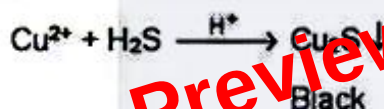
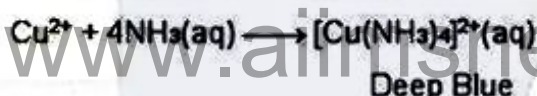
$$(E_{\text{He}^+})_{n=3} - (E_{\text{He}^+})_{n=2} = 13.6 \left[1 - \frac{4}{9} \right]$$

$$= 13.6 \left[\frac{5}{9} \right] = 7.55 \text{ eV}$$

18. Anion of a compound 'X' gives brown ring test and cation gives deep blue coloration with NH_4OH and also gives precipitate with HCl & H_2S , then compound 'X' is



Sol. Nitrates give brown ring test.



19. What is the value of second excitation energy of Li^{2+}

(1) 108.8 eV

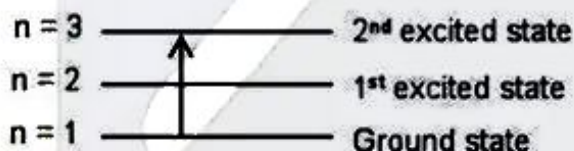
(2) 81.6 eV

(3) 13.6 eV

(4) 95.2 eV

Ans. (1)

Sol.



$$|\Delta E_{n=2 \rightarrow 3}| = 13.6 \times 2^2 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

$$= 13.6 \times (3)^2 \left[\frac{1}{1} - \frac{1}{9} \right]$$

$$= 13.6 \times 9 \left[\frac{8}{9} \right]$$

$$= 13.6 \times 8 = 108.8 \text{ eV}$$