

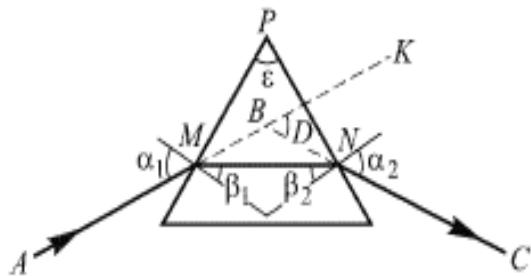
Answer on Question 46517, Physics, Optics

Question:

A ray incident on a glass prism undergoes minimum deviation when:

- incident angle is equal to the angle of refraction;
- refraction angle equals 90° ;
- incident angle equals 90° ;
- incident angle is equal to the angle of emergency.

Solution:



Let the refracting angle of a glass prism is equal ε , the angle of deviation of a ray is equal $\angle KBC = D$. Consider triangle MBN, we have:

$$D = \alpha_1 - \beta_1 + \alpha_2 - \beta_2 = (\alpha_1 + \alpha_2) - (\beta_1 + \beta_2) ;$$

From consideration of triangle MPN we have:

$$\varepsilon = \beta_1 + \beta_2 ;$$

Therefore we obtain:

$$D = \alpha_1 + \alpha_2 - \varepsilon .$$

From the last formula we can see that the angle of deviation of a ray has a minimum value when $\alpha_1 = \alpha_2$.

Answer:

A ray incident on a glass prism undergoes minimum deviation when incident angle is equal to the angle of refraction.

