Thin-Film Interference

Data

A measuring microscope is used to examine the interference pattern. It is found that the average distance between the centers of adjacent dark fringes is 0.485 mm. (*Note: The value given may be different in the WebAssign question.*)

Analysis

Taking into consideration the phase changes that take place upon reflection, which of the following is the condition for destructive interference of the reflected light? (*Note: The order of these options may be different in the WebAssign question.*)

- $2t = m\lambda_{\text{air}}, \quad m = 0, 1, 2, \ldots$

- $2t = \left(m + \dfrac{1}{2}\right)\lambda_{\text{air}}, \quad m = 0, 1, 2, \ldots$

Solve for the thickness d of the hair.