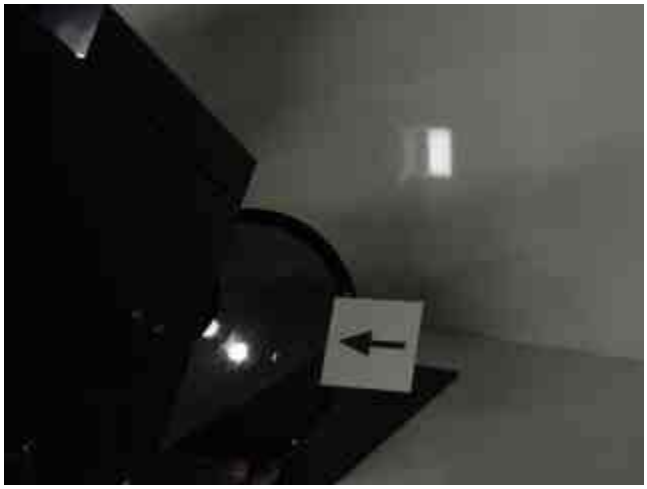
Answer #233

The answer is (c): the intensity of the reflected light will decrease to zero. For the case of reflection from a dielectric surface, the reflected light will all be polarized along the direction of the surface - here, horizontal. This is seen in the photograph at the right, in which the polarizing sheet has been rotated so that its axis as vertical, as seen by the arrows. Clicking on the photograph at the right will display an mpeg with the polarizing sheet rotating from horizontal to vertical.

So here is the test question. Suppose that we replace the water surface by a piece of very smooth black plastic, as seen in the photograph below. When the polarizing sheet is rotated from horizontal to vertical, what will happen to the intensity of the reflected light?



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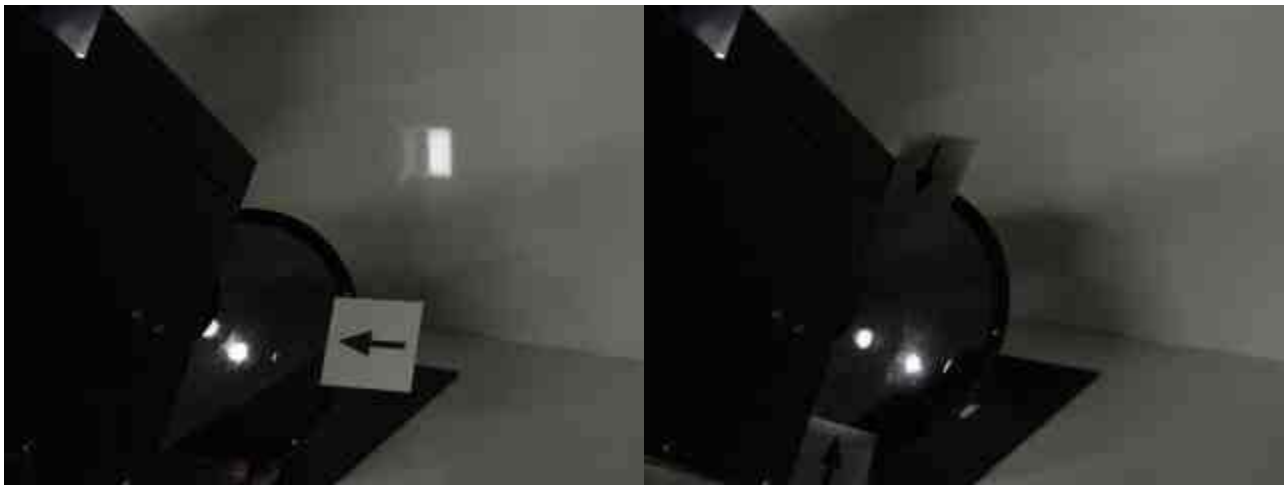
The answer is (c): the intensity of the reflected light will decrease to zero. Plastic is another dielectric. This is seen in the photograph at the right, in which the polarizing sheet has been rotated so that its axis as vertical, as seen by the arrows. Clicking on the photograph at the right will display an mpeg with the polarizing sheet rotating from horizonatl to vertical.



This behavior is the same for any dielectric when the angle of reflection is very close to the Brewster angle for that material.

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