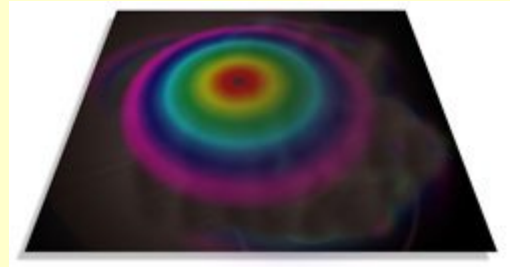


Permanent Thin Film Colors

Light incident on a thin film, such as a thin layer of gasoline on water, will be reflected from the top and bottom surfaces of the film. When the reflected light waves exit the film, they interfere. This interference gives rise to the iridescent colors often associated with soap bubbles and oil slicks. These colors are as short-lived as the films that produce them. However, there is a way to capture the beauty of a thin film for posterity. Using a drop of inexpensive clear finger nail polish and a sheet of black construction paper, a thin film and its attendant colors may be made permanent.



Obtain a pan or glass dish large enough to accept a 4" X 4" sheet of black construction paper. After filling the container with water, put the construction paper in the water making certain that it is completely submerged. Use the nail polish applicator brush to apply one drop of nail polish to the center of the water. The nail polish should quickly spread out over the surface of the water. After the nail polish has stopped spreading, slowly lift the construction paper out of the water. The nail polish should adhere to the surface of the paper. Allow the paper to dry. What do you observe on the surface of the dried paper? Remembering that the nail polish was colorless, can you explain the origin of these colors? Did you note that the colors change as you tilted the paper? Why does this happen?