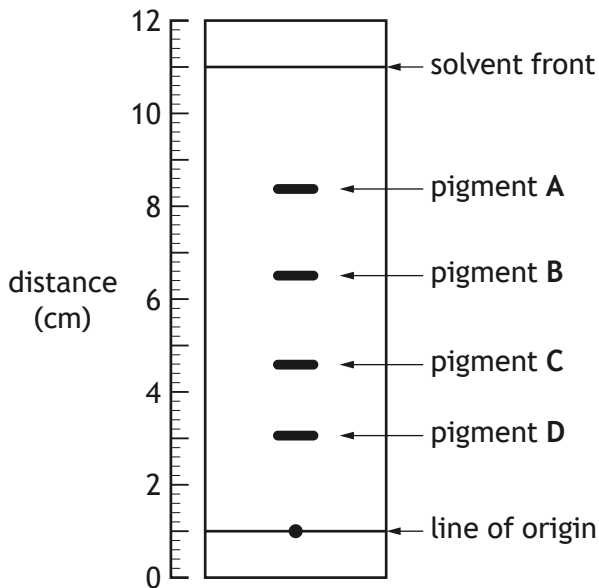


19. Pigments were extracted from plant leaves and separated using thin layer chromatography.  $R_f$  values for each pigment can be calculated using the formula:

$$\frac{\text{distance travelled by pigment from the line of origin}}{\text{distance travelled by the solvent from the line of origin}}$$

The diagram shows a chromatogram in which four plant pigments have been separated. The table gives the  $R_f$  values of some plant pigments.



Pigment	$R_f$ value
Chlorophyll a	0.35
Chlorophyll b	0.20
Carotene	0.74
Xanthophyll	0.55
Anthocyanin	0.45
Phaeophytin	0.59

Using information from the chromatogram and the table, identify which pigment is xanthophyll.