

PW N°04: Identification of Chlorophyll from Lettuce and Spinach by TLC

1. Introduction

Solvent extraction is a widely used technique for separating a product from a mixture obtained at the end of a chemical reaction or for isolating a chemical species from a mixture of natural substances.

2. Principle

Solid-liquid extraction involves transferring a substance from a solid into a solvent in which it is soluble and can be easily recovered. The process requires prolonged contact between the solvent and the solid, which is usually ground before extraction.

3. Extraction of Chlorophyll from Lettuce and Spinach

- Grind the lettuce leaves in a mortar using a pestle.
- Macerate the ground material obtained in alcohol (or acetone: propanone or propan-2-one).
- Filter the mixture. The filtrate is obtained.
- Add benzene to the filtrate, shake, and let it stand.
- Chlorophyll is more soluble in benzene than in alcohol. It can be found in the upper benzene layer, which appears green (chlorophyll), while the lower alcohol layer retains the yellow and orange carotenoid pigments.

Thin Layer Chromatography (TLC) of the Filtrate

The stationary phase consists of a thin layer of silica gel deposited on an aluminum plate.

Draw a line about 1 cm from the bottom edge with a pencil, without damaging the silica layer

Place a drop of the crude chlorophyll extract on the stationary phase.

Mobile phase (eluent):

It is the solvent in which the constituents of the mixture are more or less soluble.

Eluent composition: petroleum ether / diethyl ether (40/60 by volume).

The eluent migrates along the stationary phase by capillary action.

It causes the constituents of the mixture to travel at different speeds.

