



An essential element

1. is required for a plant to complete its life cycle;
2. cannot be replaced by another element;
3. is directly involved in the plant's metabolism; and
4. is required by many different plants.

Adapted from Arnon, D., & Stout, P. (1939, July). The essentiality of certain elements in minute quantity for plants with special reference to copper. *Plant Physiology*, 14(3), 599–602.

