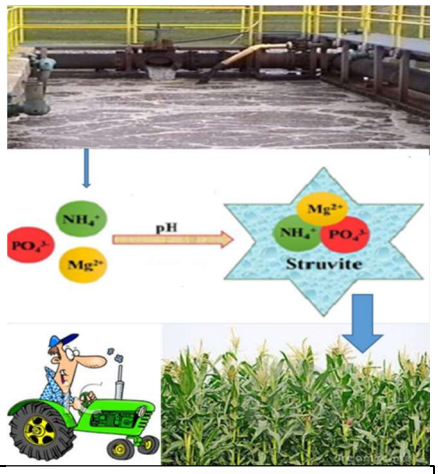
Summary

Phosphorus Recovery from Wastewater



Target age

Age 15-19 and over

Level of difficulty

☐ Easy X Medium ☐ High

Key words:

Sustainability, Recycling, Agriculture, Wastewater, Circular Economy

Abstract of the activity:

The laboratory activity is planned in one part as theoretical training under the guidance of the teacher and in another as practice where students become the main protagonists of all phases of the work (from design to evaluation). The aim of the laboratory activity is to produce the synthetic urine, from which the struvite (rich of phosphorous) is extracted, and to build a simple prototype reactor for the extraction of struvite from synthetic wastewater.

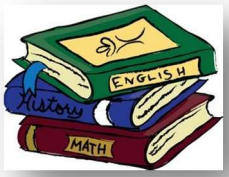
Learning Goals

- make aware of the recycling of P from wastewaters to reduce the exploitation of natural resources.
- learn through laboratory activities how wastewaters are a powerful nutrient resource for agriculture and the environment
- know the P sources and the importance of Phosphorous

Summary

Specific Abilities - *At the end of the activity the student will be able to:*

- Developing skills in using scientific equipment correctly and safely.
- Making observations, taking measurements, and carrying out well-defined scientific procedures.
- Making experience with team-working and troubleshooting during a practical activity.



Cross-curricula Links*:*

- Ecology/Environment
- Agriculture
- Biology
- Chemistry: i.e. redox reaction, analytical techniques
- Economics/Economy
- Physics
- Technology

Prerequisites - *Knowledge and skills necessary for carrying out the activity*

- Basic knowledge of chemistry
- Basic knowledge of hydraulics

Time requirement

☐ 3 h

Instruments*: pH meter and balance; the materials required for the reactor are available at DIY stores.*

Learning and Teaching Support Materials - What you can find in the toolkit

1. Lab Procedure - Module 1
2. Building Instructions – Module 2
3. Students' Cards (2)
4. Tutorial Videos created by students after this activity

RM Ambassadors

Authors: Ornella Francioso, UniBo, *email* ornella.francioso@unibo.it
Prof. **Franca Faccenda**, *email* franca.faccenda@liceogalvani.it
Mauro Murgia, ISMN-CNR, *email* m.murgia@bo.ismn.cnr.it
Alberto Zanelli, ISOF-CNR, *email* alberto.zanelli@isof.cnr.it