SMART-Plant

Scale-up of low-carbon footprint material recovery techniques in existing sewage treatment plants

SMART Nutrients

Calcium Phosphate, Aqueous Ammonia and Ammonium Sulphate, Spent Zeolite Resin, Struvite and Biofertiliser

Elemental nutrients, including phosphorus and nitrogen, are essential to all living organisms and key resources to enable food production security and manufacturing in Europe. Economically strategic industries rely on nutrients to deliver products and services, including agriculture, pharmaceutical and chemical industries. Following a circular economy approach, SMART-Plant demonstrated the recovery of various nutrient products from municipal wastewater using innovative technologies.

Ion exchange processes (IEX) were tested to remove nutrients from municipal wastewater and recover them as calcium phosphate, aqueous ammonia and ammonium sulphate.

Phosphate was also recovered in the form of struvite in the SCEPPHAR process, and this can be applied directly in agriculture for its good fertiliser properties. The new EU fertiliser regulation even allows the application of struvite in organic farming, which opens new market opportunities.

Biofertiliser is a phosphorus rich compost, which is produced from P-rich sludge using an advanced composting process. A highly stable product rich in P and N is obtained in less than 3 months, and it can be applied as a bio-based fertiliser.

WWW.SMART-PLANT.EU

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IEX

Calcium Phosphate

- High purity product with 13 % P content
- Low impurities (Al < 0.4 mg/g, heavy metals < 0.1 mg/g)
- Used as a raw material for fertiliser, pesticide and chemical production

Aqueous Ammonia and Ammonium Sulphate

- Aqueous ammonia (3 - 7 g N/ L) as raw material for plastic, textile and cleaning products
- Ammonium sulphate (21 % N) as raw material for fertiliser and in chemical production
- Low impurities (heavy metals < 5 µg/L)

Spent Zeolite Resin

- IEX media rich in potassium and ammonia that can be used as a conditioner in composting
- Direct use as slow release fertiliser in agriculture, forestry, energy crops and gardening

SCEPPHAR

Struvite

- Use as a feedstock in fertiliser industry
- Direct use in agriculture, forestry, energy crops and gardening
- Slow-release fertiliser
- High purity and safe for the environment

Dynamic Composting

Biofertiliser

- Direct and safe use in agriculture
- Bio-based fertiliser: nutrient rich stabilised organic amendment
- Demonstrated high agronomic quality equivalent to mineral fertiliser

www.cranfield.ac.uk/smartplant
www.innoven.it
www.betatechcenter.com
www.genocov.com

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