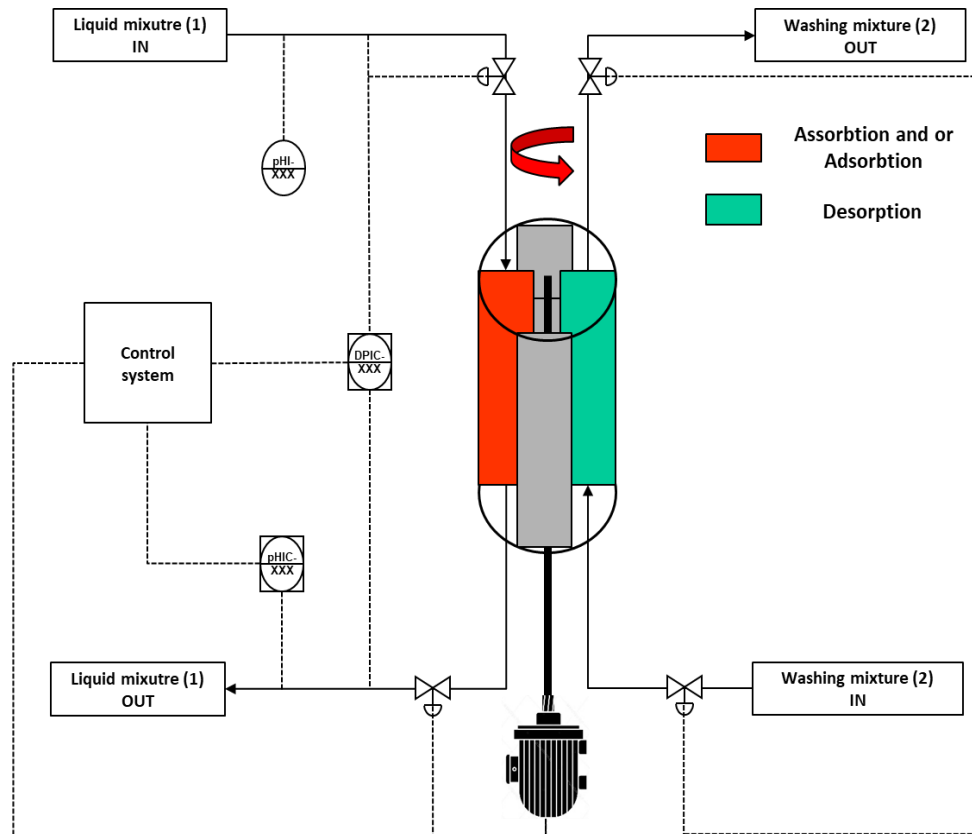


REACTOR FOR THE TREATMENT OF SLUDGE WITH HIGH NITROGEN CONTENT



PRIORITY NUMBER:

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KEYWORDS:

Treatment of zoo technical sludge

Ammonia nitrogen

Biogas/biomethane

Capture chemical elements

Nitrogen treatment

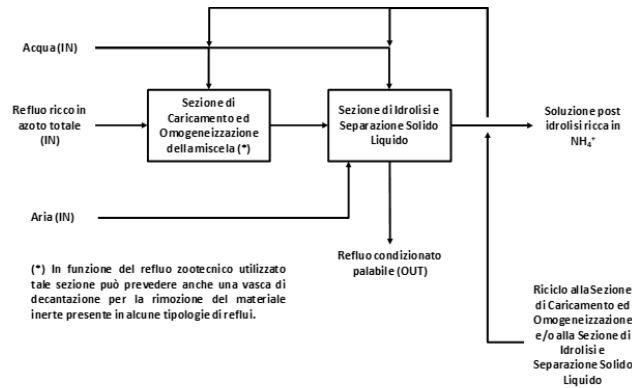
Nitrogen in the form of ammonium ion (NH_4^+) is one of the main culprits of groundwater eutrophication. One of the main causes of this phenomenon is the intensive use of synthetic nitrogen-based fertilizers and that one. On the other hand, agricultural products need this important element to grow. The present invention relates to a reactor for the capture of chemical elements or compounds from a liquid mixture.



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DESCRIPTION:



The reactor is composed of two fixed beds ($n \geq 2$) adsorbents / desorbents placed on a circular crown connected to a rotating shaft placed in the center of the crown, which allows the single fixed bed to pass from an absorption situation to a desorption one by changing (1), and with respect to the washing solution (1).

The number of adsorption / desorption beds will depend on the sizing of the beds or on the characteristic times of the two adsorption and desorption phases as well as the fluid dynamics (load losses).

When the material is adsorbent / desorbent it will be exhausted, the fixed bed will be replaced by simple mechanical operations when it is in the rest position.

The adsorbent / desorbent material can be regenerated, recycled or disposed of as appropriate.

ADVANTAGES:

- Removal of nitrogen present in the sewage, manure and digestate;
- Stabilization of biological process of anaerobic digestion (if the case);
- Contextual recovery of Nitrogen in the form of ammonium ion;
- Nitrogen reuse, in a circular economy approach, as a biological (liquid) fertilizer to replace the fossil based-one.

APPLICATIONS:

- Treatment in zoo technical wastewaters with high nitrogen content (in decreasing order of total nitrogen content: pollen, pig slurry, slurry and bovine manure) after a suitable hydrolysis pretreatment;
- Capture of ammonia nitrogen that is formed during the hydrolysis phase of biomass in biogas / biomethane plants.

