micropollutants in water

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watertreatment - France

ready for the resource revolution

Suez
micropollutants in wastewater
an « emerging » subject, a growing concern

- pesticides
- metals/metalloids
- endocrine disruptors
- medical residues, hormones...
- plasticizers, detergents...

- a proven impact on natural environment (fishs’ reproductive organs…)
- potential effects on human health (cocktail effects…), and a causal link still unknown
- existing wastewater treatment plants remove only a little part (which goes into the sewage sludge)
what strategy for the reduction of micropollutants?

reduction at the source, necessary but not sufficient?

- 100,000 chemical molecules listed in Europe
- frequent nonpoint source pollution (e.g.: drugs and hormones)
- inertia (e.g.: atrazine)

why complementary treatments on plants?

- wastewater treatment plant, **strategical point** for central collection, and last point before natural environment
- an **affordable** treatment cost: 2 to 3 €/inhabitant.year (< 2% of the water bill)
- induced benefits: **reuse**, energetic efficiency of wastewater treatment plants...

→ relevant combination of « preventive » and « curative » approaches

focus: Switzerland
how to treat micropollutants?

available technologies at a reasonable cost

- processes resulting from 14 years of research and development
- major references: Sophia Antipolis, Dübendorf (Switzerland), Lausanne (Switzerland)
- a favorable impact attested on the aquatic life on natural environments
  → decrease of the ecotoxicity and removal of the endocrine disruptors’ effects

adsorption

- activated carbon

oxydation

- ozone

→ develop the competencies of the European companies in terms of exporting
  (an increasing interest in China, Australia, Singapore (IWA trade fair)…)

focus: Lausanne
and the micropollutants trapped on sewage sludges?

researches in progress about sludges

- need to acquire additional knowledge
- measure of the impact (agricultural fertilizers…)

promote advanced sludge recycling

- **energy valorization** (methanization, advanced thermal uses) : biomethane, electricity, heat
- **materials recycling** : reuse of phosphorus and nitrogen
more recently, other emerging subjects...

**microplastics**

14,000 billion
fibers produced everyday in France in washing machines

**antibiotic resistance** from bacteria (linked to **microorganisms**)

70%
of bacteria responsible of nosocomial infections are resistant to at least one antibiotic supposed to treat them
**our approach,**
to get an overall view of « micropollutions »

**why getting an integrated view of micropollutions ?**

- **links** between micropollutions (micropollutants, microplastics, microorganisms)
- study of the impacts of a treatment on other micropollutants
- **induced benefits** of a treatment: e.g. reuse
a proactive approach to strengthen European leadership on micropollutants:
our suggestions

- to consolidate a common European knowledge base on micropollutants
- to get a balanced approach between reduction at the source and treatment of micro-pollutants
- to establish a global calendar
- to promote large-scale projects in order to consolidate the expertise in exportation