

## European Phosphonates Association - input to the revision of the EU Ecolabels related to detergents

**We welcome and support the proposal to remove the ban on phosphonates that are non-biodegradable from all Ecolabel product groups related to detergents.**

We would like to remind about our key issues:

### **Topic 1: Biodegradability**

**The phosphonates<sup>1</sup> used in detergents are not readily biodegradable<sup>2</sup>, however a number of studies<sup>3</sup> have shown that they do biodegrade slowly in both river water (2), river sediment (3) and in soil (1, 2).** This is confirmed by the fact that a number of bacteria, yeasts and fungi have been shown to be capable of breaking down phosphonates to use the carbon and phosphorus they contain (5). This tends to occur in natural systems, where phosphorus is scarce (the micro-organisms break down the phosphonates in order to liberate and metabolise the contained phosphorus), but not in laboratory biodegradation tests which usually use a phosphate-rich medium to sustain microorganism development.

Detergent phosphonates, in the form of metal complexes, which will generally be the case in nature and in sewage, are also broken down by a number of **abiotic mechanisms**:

- **light** (photodegradation) with a half-life of 5 – 23 day<sup>4</sup>, which will be the principal breakdown pathway in water and topsoil
- **oxidation** catalysed by natural minerals and micro-nutrients, e.g.: copper, manganese<sup>5</sup> or iron, which will be common in the environment<sup>6</sup>
- **free radical ions**, which occur in soils, in particular in the presence of organic materials

Because **phosphonates do not bio-accumulate and have no chronic toxicity and no aquatic toxicity issues**, this slow biodegradation does not result in risks, as shown by the assessments carried out under the HERA<sup>7</sup> programme and under REACH. **Therefore the readily biodegradable criterion is not relevant here, since there are no toxicity or eco-toxicity issues for phosphonates used in detergent.**

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<sup>1</sup> The most relevant phosphonic acids applied in detergents are HEDP (CAS 2809-21-4), DTPMP (CAS 15827-60-8), ATMP (CAS 6419-19-8), EDTMP (CAS 1429-50-1) and PBTC (CAS 37971-36-1)

<sup>2</sup> 'Readily biodegradable' means 60 or 70% degradability in 28 days in conditions under OECD 301 A-F (intended to simulate a sewage works).

<sup>3</sup> (1, 2, 3, 5): Saeger et al. 1977, 1978, 1979, and undated, see REACH dossiers

<sup>4</sup> Phosphonates and their degradation by microorganisms, S. Kononova, M Nesmeyanova, *Biochemistry (Moscow)*, vol. 67, n°2, pp 184-195

<sup>5</sup> Manganese-catalyzed degradation of phosphonic acids, Nowack et al., *Environ Chem Lett*, 1, pp. 24-31, 2003

<sup>6</sup> Environmental risk assessment of phosphonates, used in domestic laundry and cleaning agents in the Netherlands, J. Jaworska et al., *Chemosphere* 47, pp 655-665, 2002

<sup>7</sup> HERA 2004 <http://www.heraproject.com/files/30-F-04-%20HERA%20Phosphonates%20Full%20web%20wd.pdf>

## **Topic 2: Eutrophication**

### **The phosphorus (P) in phosphonates is not relevant to eutrophication:**

- To be effective, phosphonates are needed in detergents at doses which are an order of magnitude lower than for phosphates, which is why the P-limits in the EU Detergent Regulation effectively “ban” phosphates, whilst allowing the continuing use of phosphonates as necessary.
- Phosphonates from detergents are a very minor contribution to total phosphorus in sewage. Less than 1% of total sewage phosphorus taking into account other sources such as food wastes, water treatment, background and surface runoff, food industries etc.
- In sewage works<sup>8</sup>, 80 – 97% of phosphonates are removed from water to the sewage sludge<sup>9</sup>. Tertiary treatment (or P-stripping) is not necessary for phosphonates to be removed<sup>10</sup>, they are mainly removed in the biological process of treating organic matter in the sewage. Any phosphonates reaching surface waters will tend to adsorb to sediments.

## **Topic 3: Levels of phosphorus**

The [EU Detergent Regulation \(259/2012\)](#) limits the use of phosphorus in consumer laundry detergents to 0.5 grams per wash, and 0.3 g/wash in dishwasher detergents. Phosphonates are highly effective components of modern laundry and dishwasher detergent formulations. They contribute to **achieving cleaning performance and hygiene with ecological wash programmes**: lower temperatures and less intensive wash cycles, reducing energy consumption, water use and detergent doses. In phosphate-free laundry and dishwasher detergents, phosphonates are particularly important to ensure this eco-performance. It is therefore important that the phosphorus limits are set to ensure that effective washing performance and hygiene standards are met.

**We therefore advocate that the P limits set in the EU Ecolabel Criteria should be aligned with the EU Detergent Regulation.**

EPA (the European Phosphonate Association) is a Sector Group of Cefic, the European Chemical Industry Council.

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<sup>8</sup> This figure is for secondary biological sewage treatment. Even in sewage works operating only “primary treatment” (settling without treatment) over 50% of phosphonates are removed

<sup>9</sup> See HERA Report “Human & Environmental Risk Assessment on ingredients of European household cleaning products: Phosphonates” <http://www.heraproject.com/files/30-F-04-%20HERA%20Phosphonates%20Full%20web%20wd.pdf> – Nowack, Water Research 36, p 4636-4642, 2002, in tests in real sewage works, found 95% removal after secondary (standard biological) treatment, and 97% after iron-dosing (nutrient removal)

<sup>10</sup> Either biological or chemical nutrient removal will result in even higher phosphonates removal rates