Environmental stewardship program for polymers used in cleaning products

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**Ingredient Stewardship**

*What?* Water-soluble polymers are important ingredients in down-the-drain cleaning products as they have multiple functions and bring unique performance benefits.

*Why?* Polymers have been exempted from regulatory actions globally, but registration of new polymers is now required in some countries (e.g., US, Canada, Australia, Japan, Korea). Polymers are expected to undergo REAch registration in the near future.

*How?* The objective of this program is to prepare industry for the anticipated need to register polymers and also to support the environmental safety of polymers that are used in household cleaning products. To that end, the American Cleaning Institute (ACI) is leading an environmental stewardship program for key polymers used by its members in the formulation of cleaning products.

**Landscape Assessment of Available Data to Support Ecological Risk Assessment**

**Polymer Data**

- **Polymer Uses**: Household cleaning and personal care products at a concentration range of ≤0.1-5%.
- **Polyquaternium-10**: A cationic cellulose polymer with quaternary ammonium functionality, varying in charge density and MW. A representative structure is illustrated below:

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Polyquaternium-10: CH₂(CH₂)ₙCH₂CH₂CH₂CN(CH₃)₄
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- **Activated Sludge Kd Studies**: Activated sludge Kd will be used to derive a waste-water treatment plant removal to support the environmental exposure assessment for polyquaternium-10. Preliminary findings suggest that polyquaternium-10 is irreversibly sorbed at low concentrations. Follow-up studies are in progress to measure Kd at concentrations that the polymer will be present in the water column of these studies.

**Towards an Refined Environmental Safety Assessment**

By leveraging the data on aquatic effects to algae, Daphnia and fish embryo, and using the new activated sludge Kd data, a robust and data-based environmental safety assessment will be conducted for Polyquaternium-10.

Future efforts are planned to evaluate additional classes of polyquaterniums.

**CONCLUSIONS AND NEXT STEPS**

- Continue to progress PQ10 activated sludge Kd.
- Evaluate additional classes of polyquaterniums, cationic polymers.
- Build knowledge-base and capability.