

Request for the exemption; the use of PVdF in lithium-ion batteries (LIB).

Measures sought

Exemption for the use of PVdF for LIB use.

1.Socioeconomics

Pouch-type lithium-ion batteries (hereafter, LIB) are widely used as power sources for mobile devices such as smartphones, and their marketed size is \$32 billion/year or more. It is almost impossible to replace LIB with other batteries due to its light weight and large capacity.

Separators are one of the essential components of LIB. A process of applying an adhesive layer on the surface of the separator and wet heat-pressing after impregnation with an electrolytic solution to provide rigidity to the battery itself and to suppress deformation during charging and discharging is widely used, and this method can improve the life of the battery. ^{*1} PVdF(Poly Vinylidene Fluoride) has been used as a material for its adhesive layers for more than 20 years. PVdF is polymeric but falls under PFAS defined by Annex XV Dossier.

*1 Patent Gazette EP2696391, Patent-publication US2018/0123106



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2.Risk of substances

Because polymers generally do not cross cellular membranes and failed to penetrate into a cell, little human health hazard or environmental impact is noted, and we believe that they do not meet the requirements for Restriction in REACH Article 68. Residual monomers and additives contained in PVdF should be considered separately.

3. Replacement of substances

The oxidizing and reducing atmospheres of LIB are extreme environments for polymers. Potential windows of various polymers have been comparatively investigated, but no durable and practical material other than PVdF has been found so far.

4.Need for exemptions

PVdF is a material that has been used for more than two decades, and it has not been replaced by other material in a LIB of intense competition for development. This is one of the evidence as difficulties in developing new materials that can be replaced. Considering the time period required for R&D to replace new materials, such as design and evaluation, it is presumed that at least a 12-year period of exclusion is required.

However, it is not appropriate to set too much rigid period of exemption, and it is preferable to allow further extension of exemption period dependent on progress even if the whole period of exemption has been determined initially.