

Opinions against the EU/ECHA PFAS Restriction Act

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Sanming Hexafluo Chemicals Co., Ltd., a manufacturer of fluorinated chemicals in China, has been committed to the R&D and production of environmental-friendly oxy-composed fluorinated chemicals, and has made certain contributions to the replacement of PFOA and PFOS. We continuously support national & international chemical regulation and EU's efforts to reduce the risk of hazardous substances. We are also seriously striving in order to meet ECHA's requirements of chemicals. However, we believe that the PFAS restriction proposed by five EU members is too radical & excessive, as it proposed to restrict more than 10,000 organic fluorinated compounds (PFAS).

Sanming Hexafluo Chemicals Co., Ltd. has realized industrialization in the R&D and production of Perfluoroisobutyronitrile, which is the alternative for sulfur hexafluoride (SF₆).

SF₆ is an insulating gas with the advantages of high dielectric strength and low global warming potential (GWP), which is broadly used as an insulating medium for high voltage electrical equipment, and is widely used in ultra-high voltage and UHV power systems and distribution networks (SF₆ insulated switchgear and ring-grid power supply units).

However, study found that, regardless how many contributions sulfur hexafluoride (SF₆) can bring to modern society, this kind of gas also has serious environmental demerits:

1. Sulfur hexafluoride (SF₆) is uneasy to decompose and has a long atmospheric lifetime. Long-term accumulation of SF₆ leads to serious greenhouse effect:

Having a strong chemical stability, SF₆ is inert when reacting with other substances after being released into the air. During its ultra-long life cycle of more than 3,200 years, although it can photolysis and slowly settle in the stratosphere and above, it still accumulates in the atmosphere, resulting in a continuous increase in the greenhouse effect.

2. Sulfur hexafluoride (SF₆) has remarkable global warming potential (GWP):

In order to directly compare the effects of different greenhouse gases on global warming, scientists have come up with a method to measure the global warming potential (GWP values).

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO₂). The larger the GWP, the

more that a given gas warms the Earth compared to CO₂ over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases. It is a relative value comparing with carbon dioxide' GWP value, which is "1".

In this case, the GWP value of Sulfur hexafluoride (SF₆) is "23500", which means, its Greenhouse effect is 23500 times of carbon dioxide (CO₂)'s.

Perfluoroisobutyronitrile [2,3,3, 3-tetrafluoro-2 -(trifluoromethyl) propanitrile, CAS number: 42532-60-5] is an ideal insulating arc extinguishing gas that can replace Sulfur hexafluoride (SF₆) and has already been developed and industrialized so far. Perfluoroisobutyronitrile has excellent insulating arc extinguishing performance and its breakdown strength is 27.6KV, which is twice that of SF₆.

With zero Ozone depletion potential (ODP) and a low global warming potential (GWP) of 2210, (which is only one-tenth of SF₆'s), Perfluoroisobutyronitrile is used to replace Sulfur hexafluoride (SF₆) as insulating gas, which can and will be greatly reducing the greenhouse effect. In the practical application of gas insulated switch-cabinets, Perfluoroisobutyronitrile is used in the form of mixing with carbon dioxide, and the GWP value of the mixture gas is only 328, which is much lower than the GWP value of SF₆(which is as high as 23500).

Replacing SF₆ with Perfluoroisobutyronitrile could achieve a reduction of more than 99.9% of carbon emissions:

The globally used volume of SF₆ is about 20,000 tons/year, and let's estimate the leakage as 2,000 tons/year. In this case, if the SF₆ is completely replaced, we'd be equivalently reducing 46.34 million tons/year of CO₂ emission.

As an ideal alternative for SF₆, perfluoroisobutyronitrile is necessary and even urgent to be used.

While SF₆ is a persistent substance and has a significant greenhouse effect, perfluoroisobutyronitrile is neither persistent nor bio-accumulative, and has no harm to the ecological environment, which can and will effectively protect the environment and curb global warming.

In summary, we sincerely suggest that, instead of radically restrict beneficial substances like perfluoroisobutyronitrile, EU/ECHA should be paying more attention to the control and replacement of substances such as Sulfur hexafluoride (SF₆), which are not in PFAS list but have great negative impacts on the environment.

Reference:

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