The exemption application of perfluorosulfonic acid(PFSA) resins and perfluorocarboxylic acid(PFCA) resins and ion exchange membranes for chlor-alkali industry

Issue The permanent exemption application of fluoropolymers and ion exchange membranes for chlor-alkali industry

Scope monomer, synthetic fluoropolymer resin, ion exchange membrane products Chlor-alkali equipments

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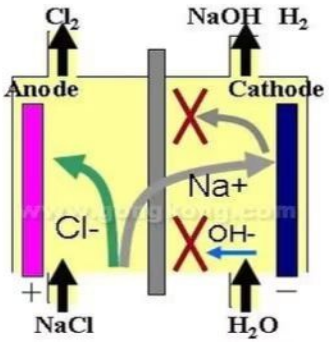
Chlor-alkali industry is the largest sector in the modern chemical industry. It is a relatively mature industry in which caustic soda, chlorine gas and hydrogen gas are produced by electrolyzing salt water. Its main products are widely used in petrochemical, light industry, textile, building materials, metallurgy and other fields, and play an important role in the development of human economy. In the future, affected by the incremental demand of downstream petrochemical, chemical, new energy, environmental protection and other industries, chlor-alkali will have further incremental demand.The core equipment of chlor-alkali industry is the electrolytic cell, and the core device of the electrolytic cell is the ion exchange membrane, which is called "the chip of chlor-alkali industry", because of its advantages of low energy consumption, low operating cost, small environmental pollution and high purity of caustic soda products.

The ion exchange membrane method, which replaces the traditional mercury method and diaphragm method, is currently the most advanced chlor-alkali industrial electrolysis method in the world. It is an advanced production process discovered by human beings after a long time of exploration and it is difficult to have a new alternative method in a short time. The ion exchange membrane method improved the structure of the electrolytic cell, and the quality of high-purity

caustic soda produced by mercury method was similar to that of mercury method, but it did not have the disadvantages that mercury method might cause mercury pollution in the environment, and also saved the steam consumption of thin NaOH solution concentrated by diaphragm method. In terms of total energy consumption, the ion exchage membrane method is lower than the mercury method and the diaphragm method, if the production of 50%NaOH commodity, the ion membrane method can save 20-25% energy consumption than the mercury method and the diaphragm method.

The ion exchange membrane for chlor-alkali industry has cation selective permeability. The membrane only allows cation and water molecules such as Na^+ to pass through, and other ions are difficult to pass through. During electrolysis, a refined NaCl solution is injected into the anode chamber of the electrolyzer, and water is injected into the cathode chamber. After energized, Cl^- is discharged in the anode chamber to generate Cl_2, which is exported from the top pipe of the electrolytic cell. At the same time, Na^+ carries a small amount of water molecules to the cathode chamber through the cation exchange membrane. H^+ is discharged in the cathode chamber to generate H_2, which is exported from another pipe at the top of the electrolyzer. Due to the barrier of cation exchange membrane, the remaining OH^- can not move to the anode chamber, and gradually enrich in the cathode chamber, and form NaOH solution with Na^+ passing through the anode chamber. Because the cation exchange membrane can prevent the passage of Cl^-, the NaOH solution generated in the cathode chamber contains few NaCl-containing impurities. The concentration of NaOH solutionand is very high.

The following is a schematic diagram of the working principle of the electrolytic cell of the chlor-alkali unit.



The ion exchage membrane is composed of perfluorinated sulfonic acid(PFSA) resin and perfluorinated carboxylic acid(PFCA) resin, which is the core component of chlor-alkali industry, and there is no alternative product in a short time. The social benefits brought by the use of this product far outweigh its possible environmental risks. Once banned, it will cause the lack of chlor-alkali industry, and then affect the normal operation of many downstream related industries such as petrochemical, light industry, textile, building materials, metallurgy and so on. Once the chlor-alkali industry returns to the original mercury method or diaphragm method electrolysis, it will have a more serious impact on the environment, energy, human health, industrial development and other aspects. The control of mercury pollution in mercury processing will be an important issue, and we should learn from the history of Minamata disease in Japan in the 1970s. The increase of salt content in diaphragm alkali can not be directly applied to the use of chemical fiber and other sectors, which will affect the development of chemical fiber industry. The accumulation and disposal of asbestos waste is another environmental problem. The high energy consumption of tons of alkali electricity will greatly increase the production cost of each chlor-alkali company, which is also contrary to the current development direction of reducing energy consumption of chlor-alkali industry.

In view of the above, we request a permanent exemption for the following products.

Monomers: tetrafluoroethylene(CAS:116-14-3), Perfluoro (4-methyl-3,6-dioxaoct-7-ene) sulfonyl fluoride (PSVE)(CAS:16090-14-5), Methyl perfluoro (5-methyl-4,7-dioxane-8-ethyl enoate) (PCVE)(CAS:63863-43-4) and so on.

Polymers：Perfluorosulfonic acid resin；Perfluorocarboxylic acid resin.

Membrane products：Perfluoride ion exchange membrane for chlor-alkali industry.