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Catalytic effects of molybdenum-based oxide compounds in a turbulent flow processor

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Wastewater originating from industrial production and human life is usually polluted by refractory organic molecules, heavy metal ions, and bacteria that are difficult to be removed by ordinary wastewater treatment plants. Efficient methods for removing these pollutants rely on advanced oxidation processes. The acting reactive oxygen species (ROS) need to be added or are in-situ generated by action of catalysts. A flow processor developed by Bauer Energy Design proved to be highly efficient in removing pollutants from wastewater and biofilms from tube surfaces. The compelling simplicity and low cost of the reverse flow processor make it widely applicable. This device made from molybdenum alloyed stainless steel relies on multiple effects producing ROS, such as catalytic actions from Mo oxide and metal molybdates present in the passivation layer of the steel. Triboelectric effects and strong swirling of the flowing water further enhance the catalytic action. The major principles will be detailed. These functionalities are also applicable for treating hydrocarbons. Current experiences and future potential for optimizing fuels will be discussed.

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