

以 2,4-二硝基苯肼衍生法搭配高效液相層析儀測量水中磷苯二甲醛

Determination of o-Phthalaldehyde in Water by High-Performance

Liquid Chromatography using 2,4-Dinitrophenylhydrazine

Derivatization

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摘要

o-Phthalaldehyde (OPA) is widely used as a disinfectant for heat-sensitive medical equipment in hospital, such as endoscopes, as a substitute for glutaraldehyde. Although OPA is less toxic and more effective in sterilization than glutaraldehyde, there is still a potential risk of irritating the skin, respiratory tract, and eyes. OPA causes bronchial asthma, contact dermatitis, and other allergic disorders. The most commonly used method for measuring OPA is derivatizing with 2,4-dinitrophenylhydrazine (DNPH) under acidic conditions and combining with HPLC-UV. However, the limitation of this method is that it produces two derivatives, OPA mono-DNPhydrazone and OPA bis-DNPhydrazone, with different ratios under different conditions, leading to measure errors. A new method is that OPA derivatives with hydrazine to form a cyclic derivative. The advantage of this method is eliminating measurement errors. However hydrazine is toxic and impact environment, and the reaction conditions are more complex, requiring a reaction time of minutes at high temperature. This study aims to modify the DNPH derivatization conditions by catalyzing with phosphoric acid to convert mono-derivatives to bis-derivatives or by merging acetonitrile into solvent to increase the rate of derivatization.

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