Method for preparing filtered samples for analysis by nuclear magnetic resonance

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Abstract

The present invention provides methods, tools and supplies to filter samples, which will be subjected to analysis by nuclear magnetic resonance. The invention includes a sintered glass filter system, simple and easy to use for the preparation of free-particle samples.

Background

Since the early 60s, the methodology of sample preparation has been uneven and dependent on the experience and creativity of the user. Early methods included the use of a sample filter for NMR analysis consisting of a funnel-type glass piece usually manufactured without specification in the glass-blowing workshops. This small funnel rested on the mouth of the NMR tube, which by nature is fragile and easily broken by the direct pressure of the funnel resting on it. Alternatively, nowadays cut Pasteur pipettes are used for sample preparation for NMR, in a similar manner as glass funnel are used. In both cases, the funnel is packed manually with a small portion of cotton or fiberglass while maintaining the drawbacks. Because of these practices, the mouth of the tubes is frequently damaged resulting in loss of useful tubes for optimal determinations and the negative economic impact given the high cost of each tube.

Description

The invention relates to a method for the preparation of filtered samples for analysis by Nuclear Magnetic Resonance (NMR), in which a fixed system of a sintered glass filter is incorporated; it is simple and easy to use for the preparation of particle-free samples. The invention allows sample preparation for NMR analysis in a simple, quick, clean and safe manner, free from particles for optimal quality determinations.
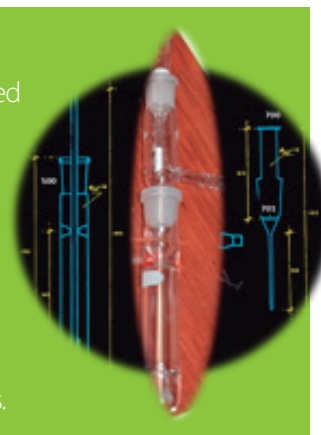
Advantages

The invention is advantageous over the prior methods due to the simplicity of its steps, elements, usage, and the way that it allows to solve with generally good results the problem that all NMR users face when handling and preparing samples requiring filtration for NMR analysis.

Likewise, the present invention:

- Allows reducing costs by extending the life and care of NMR tubes of all laboratory and industry using the NMR technique.
- Facilitates the use of the appropriate amount of deuterated solvent required in the preparation
- Allows for deployment and use that does not require any user training, which results in improved and facilitated handling of samples to be analyzed by NMR; otherwise it is necessary to discard damaged tubes or request repair of the tubes to the glassblowing technical area, which eventually motivates the destruction of valuable NMR tubes and drastically shortening their useful life.
- Allows for easy cleaning, and even gives the possibility of previously sterilization of the system.
- Reduces risk of breakage of the tips of the tubes;
- Has a relatively low cost.

Compared with existing commercial devices, which only allow the preparation of a single sample and require cleaning before reuse, the method allows the use of multiple pieces of sintered filters, as needed, to be interchangeable in the fixed system of the sintered glass filter, making it possible to prepare samples in series or even multiple filtration of samples.

Applications Market

While the market of instruments and supplies for instrumental analysis by nuclear magnetic resonance is large and in high demand in the chemical, pharmaceutical, oil, and cosmetics industry, and even in the field of art, there are no similar alternative methodologies on the market as the present proposed invention that provides simplicity in the methodology of preparation and filtration of samples for analysis by NMR, which has a relatively low cost and has advantages in terms of ease to put into practice.