



SiliaBond®

Working with Silver Nitrate (AgNO₃) Silica-based Products

Chromatography with silver nitrate is a well known and established methodology for the separation of nonpolar compounds with similar polarities. Usually, with a mixture of unsaturated compounds such as alkenes, lipids, steroids, terpenes, etc. standard separation procedures lack in efficiency. However, by using SiliaBond® Silver Nitrate for your column chromatography (*also offered pre-packed in our SiliaSep™ flash cartridges*) along with SiliaPlate™ AgNO₃ for your TLC, you will have the necessary tools to circumvent the problem.

LEARN MORE

about SiliaBond in our brochure "Solutions for Purification & Chromatography."

Working with Silver Nitrate (AgNO_3) Silica-based Products

SILIA BOND® SILVER NITRATE AND SILIA SEP™ FLASH CARTRIDGES

The theory behind this separation is based on the property that silver ions can complex with unsaturated compounds (π bond). This kind of chromatography with silver nitrate impregnated silica gel is very easy to perform and very efficient. It is mainly used for the separation of cis/trans isomers of unsaturated compounds such as alkenes, lipids, steroids and terpenes. Two possible loadings are offered, 10% (R23530B) and 14% (R23630B) to suit your needs. The AgNO_3 is impregnated on the silica, meaning that it is immobilized through electrostatic interactions.

This chromatographic phase can be used as a normal phase, but it is much less polar than bare silica. It is typically used with low polarity eluents, such as hexanes, ethyl acetate, dichloromethane, ether, etc. In fact, polar protic solvents, like methanol, ethanol, water, etc. should be avoided. Indeed, since silver nitrate is slightly soluble in those solvents this could lead to some leaching. If the chromatographic conditions that have to be used lead to some leaching and this contamination is an issue, it is noteworthy that the silver ions (Ag^+) can be easily removed using SiliCycle SiliaMetS® Thiol and thus clean the extract.

Because of its sensitivity to light, Si- AgNO_3 should be used under darkroom conditions as light will degrade the product resulting in a greying of the gel. This color change is caused by the oxidation of AgNO_3 to AgO . For an easier use of this product, a SiliaSep™ flash cartridges pre-filled with silver nitrate silica gel could be a good alternative. Indeed, the fact that the gel is pre-packed in a closed cartridge slows down the degradation reaction. As an additional precaution to protect the cartridges from light, we suggest opening the box in the dark and immediately resealing the box afterwards. It is also strongly suggested to cover the flash cartridge with aluminum foil while using it. Finally, due to the instability of the SiliaBond® Silver Nitrate, it is not possible to reuse it. Furthermore, both products have a shelf-life of one year if stored in proper conditions.

SILIA PLATE™ AgNO_3 FOR TLC

TLC plates impregnated with silver nitrate are also very sensitive to light and must always be protected from light. To achieve this, we suggest opening the box in the dark and immediately resealing the box afterwards. It is also strongly suggested to cover the elution chamber with aluminum foil. Nevertheless, it is possible to observe an overall greying of the plates over time which is normal. This color change is due to the oxidation of AgNO_3 to AgO . The plates will get darker and darker as they are exposed to even faint light. For this reason, TLC plates have a shelf life & lifespan of 6 months. Yet, this does not change their overall effectiveness. Indeed, apart from the esthetic aspect, the plates are fully functional and the greying does not have a negative effect on how the plate works, apart for the spots being less easily visualized.

Three possible loadings are offered on glass support, 10% (TLG-R23511B), 15% (TLG-R23611B) and 20% (TLG-R23711B), to suit your needs. You don't know the loading required? No problem! We also have a kit (TLG-R23M11B) containing plates with loading of 5, 10, 15, 20 % of AgNO_3 (5 TLC each).

These plates could be more difficult to reveal/visualize. Indeed, it is possible to use a 254 nm UV lamp, but this requires compounds with intense UV absorbance, or it is necessary to work at high concentration to be able to distinguish the spots associated with the products.

"Classic" stains are not compatible with this type of plate. Instead, a solution of sulfuric acid (H_2SO_4) in methanol or phosphomolybdic acid (PMA) in methanol must be used. As a starting test, we suggest 250 mg of the acid (either sulfuric or PMA) in 50 mL of methanol. This solution should then be sprayed onto the plate and the plate must then be heated to around 200°C. If the test is negative, an attempt can be made to increase the acid concentration.



 SiliCycle Inc.
2500, Parc-Technologique Blvd,
Quebec City (Quebec) G1P 4S6
CANADA  

 Phone: +1 418.874.0054
Toll Free +1 877.745.4292 (North America only)
 Email: info@silicycle.com

 Website: www.silicycle.com

 Follow us:     