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Application Note

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Concentration to a defined final volume with Vivaspin® Turbo 15, Vivaspin® Turbo 4 and Vivaspin® 500

Rik McRae[1], Hannes Landmann[2,*]

1. Sartorius Stedim Lab Ltd, Sperryway, Stonehouse, Gloucestershire, GL10 3UT, UK
2. Sartorius Lab Instruments GmbH & Co. KG, Otto-Brenner-Straße 20, 37079 Göttingen, Germany

[*] Correspondence
E-Mail: hannes.landmann@sartorius.com

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Abstract

This short Application Note describes how you can use Vivaspin® Turbo 15, Vivaspin® Turbo 4 and Vivaspin® 500 concentrators to concentrate to defined final volumes. By adding a particular volume to the filtrate vessel prior to the concentration, the final volume of the concentrate can be adjusted accurately.

Introduction

It is sometimes desirable to be able to preselect a defined final volume for a concentration step, especially when parallel concentrations are being performed. Vivaspin® centrifugal concentrators have a built-in deadstop feature, which prevents overconcentration to dryness. Due to the fast concentration rates possible with the patented vertical membrane design in the Vivaspin®, the drying out of the sample would otherwise be a possibility.

This note describes a method for achieving reproducible defined final volumes using Vivaspin® Turbo 15, Vivaspin® Turbo 4 and Vivaspin® 500 centrifugal concentrators. The method does not rely on the deadstop pocket but is increasing the retained volume by adding liquid to the filtrate vessel prior to centrifugation.

Equipment
- Vivaspin® Turbo 15 10kDa MWCO
- Vivaspin® Turbo 4 10kDa MWCO
- Vivaspin® 500 10kDa MWCO
- Tacta 5 ml mechanical pipette and Optifit pipette tips
- Tacta 1000 µl mechanical pipette and Optifit pipette tips
- Tacta 200 µl mechanical pipette and Optifit pipette tips
- arium® pro ultrapure water system
- Sartorius Precision Lab Balance
- Centrisart® D-16C Centrifuge with swing out rotor for 50 ml and 15 ml falcon tubes
- Centrisart A-14C Centrifuge with fixed angle rotor for 24 1.5 | 2.2 ml tubes

Reagents
1 mg/ml Bovine Serum Albumin labelled with Bromophenol blue

Methods

1. Add defined amount of water to the filtrate tube (see table below).
2. Put the concentrator insert into the filtrate tube and add sample solution.
3. Close the concentrator screw cap (for Vivaspin® Turbo 15 or Vivaspin® Turbo 4) or close the cap (Vivaspin® 500) and place in the centrifuge.
4. Concentrate the sample.
5. Remove the concentrator insert and recover the concentrate with a pipette.

Results

Results for Vivaspin® Turbo 15

Volume of water added to the filtrate tube	Volume of sample solution added to the concentrator insert	Spin conditions	Final concentrate volume (average of 8 devices)
11.5 ml	15 ml	20 min @ 4,000 xg	1.50 ± 0.02 ml
9.5 ml	15 ml	20 min @ 4,000 xg	0.96 ± 0.01 ml
7.5 ml	15 ml	20 min @ 4,000 xg	0.53 ± 0.02 ml

Results for Vivaspin® Turbo 4

Volume of water added to the filtrate tube	Volume of sample solution added to the concentrator insert	Spin conditions	Final concentrate volume (average of 8 devices)
2.0 ml	4 ml	20 min @ 4,000 xg	0.34 ± 0.03 ml
1.5 ml	4 ml	20 min @ 4,000 xg	0.15 ± 0.02 ml
1.2 ml	4 ml	20 min @ 4,000 xg	80 ± 10 µl

Results for Vivaspin® 500 in 40° fixed angle rotor

Volume of water added to the filtrate tube	Volume of sample solution added to the concentrator insert	Spin conditions	Final concentrate volume (average of 8 devices)
500 µl	500 µl	15 min @ 15,000 xg	103 µl ± 13 µl
380 µl	500 µl	15 min @ 15,000 xg	51 µl ± 11 µl
250 µl	500 µl	15 min @ 15,000 xg	30 µl ± 5 µl
200 µl	500 µl	15 min @ 15,000 xg	23 µl ± 7 µl

Conclusion

Reproducible defined final concentrate volumes can be quickly and easily achieved with Vivaspin® Turbo 15, Vivaspin® Turbo 4, and Vivaspin® 500.

Sartorius Lab Instruments
GmbH & Co. KG
Otto-Brenner-Strasse 20
37079 Goettingen, Germany
Phone +49.551.308.0
email: LF-info@sartorius.com
www.sartorius.com

USA Toll-free +1.800.635.2906
UK +44.1372.737159
France +33.1.70.62.50.00
Italy +39.0362.5557.11
Spain +34.913.586.095
Russian Federation +7.812.327.53.27
Japan +81.3.3740.5408

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