

Pelleting Studies with the Thermo Scientific Fiberlite F21S-8x50y Fixed-Angle Rotors

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KEY WORDS

- Sediment Volume
- Carbon Fiber Rotor
- Pelleting Studies

Introduction

Fixed-angle rotor usage has previously been limited to studies on rapid acceleration and deceleration in pelleting, while swinging bucket rotors have traditionally been used for density gradient methods and micro pelleting of samples¹.

In this study, sample separation and sediments were collected to compare the quantity of sediment in tubes with different tube angles for fixed-angle rotors.

Calculations show that there are negligible differences in the total sediment collected when rotors with different tube angles, similar tube sizes, tube volumes and g-forces were compared.

Results

This study calculated the maximum amounts of sediment that can be held in a Thermo Scientific Fiberlite F21-8x50y rotor with a tube angle of 23°. This amount was compared against a similar metallic rotor from a competitor with a tube angle of 34°. These tube angles were used because at the same rpm, the rotors generated approximately similar g-forces.

Table 1 compares the total sediment volume of rotors with different tube angles. Study results show that the total sediment volume calculated for rotor tubes was similar when the tubes were held vertically. However, different sediment volumes resulted when the tubes were held at their respective tube angles.

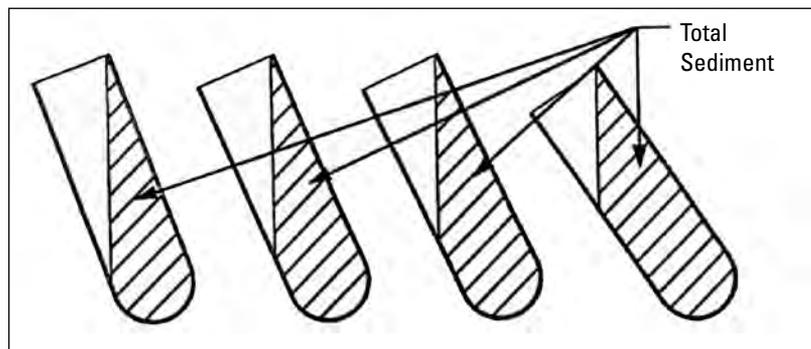
Using the two rotors mentioned above (the carbon fiber rotor at 23° and the metallic rotor at 34°), the maximum amount of sediment calculated for the Fiberlite™ F21-8x50y rotor was 23.3 mL and the total sediment in the metallic rotor was 28.2 mL, yielding a difference of 4.9 mL greater for the metallic rotor. The dif-



The Fiberlite F21-8x50y fixed-angle carbon fiber rotor

Comparison of Total Sediment Volume Between Rotors with Different Tube Angles

All Tubes 83.7 mm Long and 25.78 mm Diameter



20° Sediment	23° Sediment	25° Sediment	34° Sediment
VOL = 21.1 mL	VOL = 23.3 mL	VOL = 24.5 mL	VOL = 28.2 mL

Table 1. Comparison of total sediment volume between rotors with different tube angles. All tubes were 83.7 mm in length and 25.78 mm in diameter.

ference in sediment volume would become smaller if the total volume of sediment was less in both rotors.

During normal centrifugation conditions, centrifuge tubes are never filled with sediment particles. The

largest amount of sediment is normally less than 25% of the total tube volume. The difference in sediment volume would, therefore, be negligible when the two rotors are compared.

Conclusion

It is known that carbon fiber rotors are up to 60% lighter than metallic rotors; therefore, they may accelerate faster than metallic rotors during centrifugation. This rapid acceleration prevents the sediment from adhering to the tube walls during centrifugation. As this study shows, the difference in tube angle between the metallic rotor at 34° and the Fiberlite rotor at 23° will not prevent the researcher from purifying or separating samples with small amounts of sediment.

References

1. Griffith, O.M. (1986). Techniques of preparative, zonal and continuous flow ultra centrifugation. Palo Alto: Spinco Div., Beckman Instruments Inc.

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