

himac APPLICATION

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Subject Examination of centrifugation time when using a carbon fiber rotor that can accommodate six 1-liter bottles

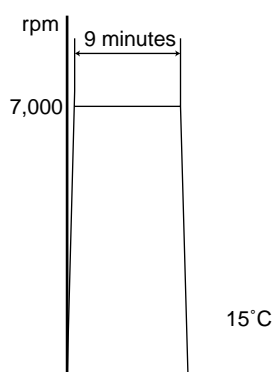
Model CR7 large-capacity refrigerated centrifuge

Examination of centrifugation time when using the R7AF2 carbon fiber angle rotor

The R5S2 swing rotor was the only one 6-liter rotor among the existing rotors for the large-capacity refrigerated centrifuges until the R7AF2 angle rotor (approximately 6 liters: six 1-liter bottles) came along. The newly developed R7AF2 angle rotor is made of carbon fiber and weighs only about 12 kg that is more than half weight reduction in comparison with the R5S2 swinging bucket rotor that weighs about 28 kg for ease of operation. The 1000PP bottle (2) that is a standard accessory of the R7AF2 angle rotor has high hermeticity thanks to the O-ring seal cap. In addition, the 1000PP bottle (2) is tough and convenient because it can be filled with desired amount of sample up to the actual capacity (maximum 910 ml). The maximum speed of the R7AF2 angle rotor is 7,000 rpm and the maximum RCF is 11,400 x g.

It is suitable for collection of bacteria from a culture solution and for ammonium sulfate fraction of protein in the supernatant of a culture solution. Following is the result of our examination on the centrifugal conditions for separation of *E. coli*. (Note that the maximum speed is 6,000 rpm when the temperature is set to 4 °C.)

Centrifugal conditions (Separation of *E. coli*: CR7 large-capacity refrigerated centrifuge was used.)



Speed	Time	Temperature	Acceleration	Deceleration
7,000 rpm	9 minutes	15°C	9	9

Explanation

Normally, the setting range of the RCF is from 4,000 to 6,000 x g and the time is from 10 to 15 minutes in the centrifugal operation to collect bacteria from an E. coli culture solution when using an angle rotor and 500-ml bottles. Thus the centrifugal conditions when using the R5S2 swinging bucket rotor or the R7AF2 carbon fiber rotor are shown in the following table. It takes about 30 minutes for a centrifugal operation including acceleration and deceleration times when using the R5S2 swinging bucket rotor. The new R7AF2 carbon fiber rotor requires only about 15 minutes, about a half of the R5S2 swinging bucket rotor for a centrifugal operation including acceleration and deceleration. Even when the settings are 4°C and 6,000 rpm, the centrifugation time is about 18 minutes including acceleration and deceleration, about 60% of the R5S2 swinging bucket rotor. In addition, the lightweight R7AF2 carbon fiber rotor (about 12 kg) is replaceable while it is almost impossible to replace the R5S2 swinging bucket rotor. The 1-liter bottle (1000PP bottle (2), actual capacity 910 ml) specifically designed for the R7AF2 carbon fiber rotor can be filled with desired amount of sample up to the actual capacity and it is very convenient.

Rotor type (weight)	Speed	Max. RCF	Bottle (actual capacity)	Set time	Centrifugation time including acceleration and deceleration
R5S2 (about 28 kg)	4,200rpm	5,150xg	1000PP bottle (920 ml)	21 minutes	About 30 minutes
R74F (about 12 kg)	7,000rpm	11,400xg	1000PP bottle (2) (910 ml)	9 minutes	About 15 minutes
	6,000rpm	8,400xg		13 minutes	About 18 minutes

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