

himac APPLICATION

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Subject Separation of cell culture solution using the carbon fiber rotors that can accommodate four 1-liter bottles

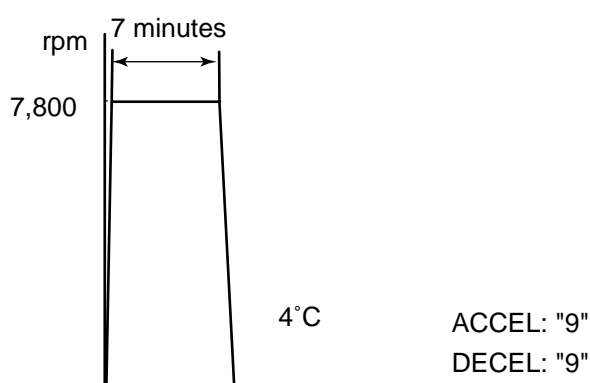
Model CR-E series high-speed refrigerated centrifuges

Separation of E. coli using the R9AF angle rotor made of carbon fiber

The R10A rotor was the highest-capacity rotor (approximately 3 liters: six 500-ml bottles) among the existing rotors for the high-speed refrigerated centrifuges until the R9AF angle rotor (approximately 4 liters: four 1-liter bottles) came along. The newly developed R9AF angle rotor is made of carbon fiber and weighs only 8.5 kg that is a 65 % weight reduction in comparison with the R10A aluminum alloy rotor that weighs 24 kg for ease of operation.

The maximum RCF of the R9AF angle rotor is 14,900 x g and it is suitable for collection of viruses 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.

Centrifugal conditions



Speed	Time	Temperature	Acceleration	Deceleration
7,800 rpm	7 minutes	4°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 viruses from an E. coli culture solution. It takes about 25 minutes for a centrifugal operation including acceleration and deceleration times when using the conventional R10A aluminum alloy rotor (capacity: six 500-ml bottles). The new R9AF carbon fiber rotor is lightweight and the time required for acceleration and deceleration is about a half of the R10A rotor, so it takes about only 12 minutes for a centrifugal operation including acceleration and deceleration times. In addition, the actual capacity of the R9AF rotor is 3,640 ml (four 910-ml tubes) maximum and it is about 1.4 times larger than the capacity of the R10A aluminum alloy rotor (2,520 ml (six 420-ml bottles) maximum). The R9AF rotor is three times more efficient than the R10A rotor considering the time required for separation. Loading and unloading the R9AF rotor is easy because it is lightweight (about 8.5 kg). Thus the R9AF rotor is superior to the aluminum alloy rotor in operability and capacity. The 1-liter bottle (actual capacity: 910 ml) specifically designed for the R9AF carbon fiber rotor can be filled with desired amount of sample up to the actual capacity and it is very convenient.

This application is prepared referring to the following report.

"A 4-L, fixed-angle, carbon-fiber rotor for high/superspeed centrifuge",
O. Mitch Griffith, American Biotechnology Laboratory, (October 1996) p. 24

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