himac APPLICATION
No. 154
Aug. 2012

Continuous harvest of large number of E. coli by using a continuous flow rotor for high-speed refrigerated centrifuge

CR22GⅢ high-speed refrigerated centrifuge / R18C continuous flow rotor

There are two main types of continuous flow rotors: one is used for ultracentrifuges and the other is used for high-speed refrigerated centrifuges. The continuous flow rotors for high-speed refrigerated centrifuges are used for separation of particles at a cellular level (that is, separation of micron-size particles,) and the continuous flow rotors for ultracentrifuges are used for separation of submicron-size particles such as viruses.

An example of using the continuous flow rotors for separation of particles at a cellular level is harvest of E. coli. E. Coli are used in many biological fields, for example, for the purpose of production of desired products by genetic modification.

Following is an example of experiment on continuous centrifugation of several tens of liters of E. coli culture suspension by using a continuous flow rotor for high-speed refrigerated centrifuge.

Description

1. Instruments

Centrifuge : CR22GⅢ high-speed refrigerated centrifuge
Rotor : R18C continuous flow rotor (Rotor volume: 1 L, sediment capacity: 500 mL or less)

2. Centrifuging conditions

Rotor speed : 12,500 rpm
Flow rate : 250 mL/min.
Amount of sample : 40L
Amount of sediment : About 200 mL

3. Decision method of the separation conditions (rotor speed and flow rate)

<Example>

(1) Experiment result of centrifugation using a fixed angle rotor or a swinging bucket rotor

- Rotor : R8S swinging bucket rotor
- Rotor speed : 8,000 rpm
- Centrifugation time : 15 minutes

(2) Calculate the apparent sedimentation coefficient of settling particles from the above result.

- K-factor of the R8S swinging bucket rotor : App. 4,000
  (Rotor speed: 8,000 rpm, R8S swing rotor's Rmax: 16 cm, Rmin: 5.86 cm)
- Sedimentation coefficient: **16,000 (S)**

$$\text{Sedimentation coefficient (S)} = \frac{\text{K-factor}}{\text{Centrifugation time (hour)}}$$

(3) Calculate the centrifuging condition (maximum flow rate) from the table of centrifugation characteristics in the instruction manual of the continuous flow rotor.

Instrument

CR22GⅢ high-speed refrigerated centrifuge

R18C continuous flow Rotor

If you have any inquiry of this application or products, please contact us through our web site.
http://www.hitachi-koki.com/himac/

Hitachi Koki Co., Ltd.
Life-Science Instruments Division
Shinagawa Intercity TowerA 2-15-1 Konan, Minato-ku Tokyo 108-6020 JAPAN
Tel: (81) 3-5783-0665
Fax: (81) 3-5783-0621
*The latest information is available on our web site.
http://www.hitachi-koki.com/himac/