material thereof are not particularly limited providing sealing of the upper part of the sample collection portion in the sample collection unit is possible. It may also be integrated with the sample collection unit 100 or the analyte storage unit for preventing loss.

The analyte sealing cap 5 is configured so that it can be arbitrarily removed or opened or closed, and by this mechanism, a sample collection means 15 described later can be easily inserted. Further, an additional sealing cap may be provided on the analyte sealing cap 5. By such a configuration, for example, the upper part of the sample collection portion 7 in the sample collection unit is sealed and a sample(an analyte) is centrifugally separated, then, the sealing cap 5 is opened again, and the centrifugally separated supernatant (serum or plasma 12, when the analyte is blood) can be recovered. Thus recovered serum or plasma 12 is a material suitable for blood analysis since the serum or plasma 12 is the same as the serum or plasma prepared by collecting blood using a syringe and the like and performing centrifugation.

It is also possible to provide an additional cap which can be opened and closed for inserting a sample collection means shown below, above the analyte sealing cap 5.

[0048]

Collection of a sample using the sample collection unit 100 will be illustrated with reference to Fig. 7.

In conducting collection of a sample, a sample 11 is allowed to contact with the lower part of the sample collection portion 7 as shown in Fig. 7, as a result, sucking of a sample starts owing to capillary action or negative pressure generated by flow of fluid, and a sample is sucked and filled in the sample collection portion 7. In Fig. 7, the sample collection unit 100 is inclined horizontally, and by this arrangement, a larger amount of a sample can be collected more easily. However, it is not necessary to be inclined when collection of a target amount of a sample is possible.

[0049]

The amount of a sample to be collected can be changed depending on the target examination and measurement, and the length and the diameter of the sample collection portion 7 can be adjusted correspondingly. For example, the amount of a sample to be collected can be adjusted in the range of 10 μL to 300 μL, preferably 10 μL to 200 μL, further preferably 50 μL to 100 μL, but the amount is not limited in this

of the sample collection unit, and a sample containing the separating agent added is prepared. When the sample collection unit containing the separating agent as described above is subjected to centrifugation, the blood cell 12 transfers to the agent holding portion 10, and the separating agent 14 transfers to a position between the serum or plasma 12 and the blood cell 13. By this, mixing of the serum or plasma 12 and the blood cell 13 can be prevented, and excellent preservation stability is obtained over a long period of time.

When the sample collection unit is inserted into the agent holding portion containing a separating agent, it is preferable to make a structure of the agent holding portion letting the separating agent escape along the side wall of the sample collection unit, so that excess pressure is not applied to the sample in the sample collection unit until the lock mechanism adhere closely to the side wall of the sample collection unit. That is, if the structure is not fitted with a gradient continuing from the bottom opening of the sample collection unit, excess pressure is applied to a sample until the lock mechanism adheres closely to the side wall of the sample collection unit, consequently, the sample, for example, blood cells are broken or hemolyzed, and the side wall of the sample collection unit does not reach the lock mechanism, in many cases.

[0052]

In the present invention, the kind, the material and the like of the separating agent which can be used are not particularly limited, and for example, those composed of silicon, α-olefin-maleate, polyester polymers, acrylic polymers, chlorinated polybutene, cyclopentadiene resins, and modified cyclopentadiene resins prepared by introducing a hydroxyl group, an ester group, an ether group, an epoxy group and the like in cyclopentadiene resins, as the main component, are listed.

[0053]

In an embodiment of adding an anticoagulant in the present invention, coagulation of the blood cell 13 is inhibited by an anticoagulant, therefore, storage or transportation under condition directly after collection is possible even if separation of plasma and the blood cell 13 by centrifugation is not conducted. It is also possible to separate plasm and blood cell by conducting centrifugation.

In addition, addition of an agent which is used

CLAIMS

1.A sample collection and separation device comprising

a sample collection unit having an inside space for holding a sample and having openings at the top and the bottom, wherein the inside space, the bottom opening and the top opening communicate, the inner diameter thereof increases from the bottom opening toward the top opening, and the wall surface defining the inside space into which a sample is placed forms a gradient continuing from the bottom opening toward the top opening,

an analyte storage unit having a housing into which the sample collection unit is inserted and having a sample collection unit bottom cap tightly sealing the bottom opening of the sample collection unit, wherein the sample collection unit bottom cap has an agent holding portion for holding an agent, a lock mechanism is provided in the agent holding portion, and it is configured that when the sample collection unit is inserted into the analyte storage unit and the bottom opening is inserted into the agent holding portion, then, the lock mechanism contacts with the end peripheral part of the sample collection unit and the sample is held sealed under condition of entering of at least a part of the agent into the sample collection unit, and

an analyte sealing cap for plugging the top opening of the sample collection unit, wherein when the analyte sealing cap plugs the top opening under condition of insertion of the sample collection unit into the analyte storage unit, the sample is sealed.

2. The sample collection and separation device according to Claim 1, wherein the wall surface defining the inside space into which a sample is placed is hydrophilized.

3. The sample collection and separation device according to Claim 1 or 2, wherein the upper part of the agent holding portion is in the form of taper.

4. The sample collection and separation device according to any one of Claims 1 to 3, wherein an agent is previously placed in the agent holding portion of the analyte storage unit.

5. The sample collection and separation device according to any one of Claims 1 to 4, wherein the agent is a separating agent.

6. The sample collection and separation device according to any one of Claims 1 to 5, wherein the agent is an anticoagulant.

7. The sample collection and separation device according to any one of Claims 1 to 6, wherein the sample is peripheral blood.