Greiner Bio-One Customer Information

VACUETTE® Plasma Tubes

Information for the preanalytical handling of Plasma Tubes

1 Recommended order-of-draw

The following order-of-draw is recommended when drawing multiple specimens for clinical laboratory testing during a single venipuncture. The order of draw is conform to the NCCLS standard H3-A5 -Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture; Approved Standard-Fifth Edition.

1 Blood culture
2 Coagulation*
3 Serum with and without gel
4 Heparin with and without gel
5 EDTA
6 Glucose
7 Others

*When drawn first then only suitable for routine tests (i.e. PT and aPTT)

NOTE: In cases where blood culture tubes are not required, GBO recommends no-additive tubes.
NOTE: Always follow your facility's protocol for order of draw.

2 Tube mixing

The recommended number of tube inversions is conform with the NCCLS standard H3-A5 - Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture; Approved Standard-Fifth Edition.

Directly after blood collection thorough mixing of the venous blood with the lithium, sodium or ammonium salt of heparin must be achieved by inverting the tube **5-10 times** without shaking. Turn the filled tube upside-down and return it to upright position. This is one complete inversion. Inadequate or delayed mixing may result in clotting and/or incorrect test results.

3 Centrifugation

Plasma is obtained by the centrifugation of heparinised whole blood. All plasma tubes including plasma tubes containing separator gel must be centrifuged no later than 2 hours following blood collection. Otherwise falsification of analysis results may occur due to long, continual contact between the blood cells and plasma.
The time and centrifugal force applied to the sediment of heparinised blood should be such as to leave no platelets in the plasma layer. Failure to completely sediment platelets will result in spurious increases in potassium, lactate dehydrogenase, acid phosphatase and inorganic phosphate from platelets remaining in the plasma of the sample.

The centrifugation should be performed at the following rcf:

Plasma Tubes:	**15 Minutes at 2.000g - 3.000g**
Plasma Tubes with Gel:	**15 Minutes at 2.200g**

It is recommended to use a 90° swing-out rotor centrifuge, so that the sediment surface is formed at right angles to the tube wall.

Ensure correct placement of the tube in the centrifuge. Incorrect placement can result in separation of the safety cap from the tube.

Centrifugation should be perfomed in a cooled centrifuge in the range of 15-24°C.

Please note that incorrectly prepared centrifuges deliver poor quality samples. In a normal use laboratory centrifuge 2.200g (with a radius of approximately 180mm) corresponds to approx. 3.500 revolutions per minute.

Renewed centrifugation following storage of the sample at 4-8°C should be avoided.

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Wear gloves during venipuncture and when handling blood collection tubes to minimize exposure hazard.

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4 Special aspects

The procedure is governed by the stability of the constituents of the sample. The most important causes for alterations to the quality of specimens are: Metabolism of blood cells, evaporation/sublimation, chemical reactions, microbiological decomposition, osmotic processes, effect of light, gas diffusion.

Rapid transport and short storage times improve the reliability of laboratory results.

Samples are preserved longer the cooler they are stored. (Please note exceptions)

Samples should always be stored in closed VACUETTE® tubes (evaporation!). The danger of evaporation also exists in refrigerators (condensation of moisture on the cooling device). - Avoid shaking the VACUETTE® tube (pneumatic tube dispatch system): risk of haemolysis.

Avoid storage of uncentrifuged heparinised whole blood.

Avoid the effect of light otherwise there will be a fall in the values of various analytes. Examples include vitamins A and B6 and porphyrins. These specimens should be protected with an aluminum foil wrap or equivalent.

Reduce contact with air as far as possible. If this is not done, evaporation/sublimation will result in an apparent increase in the concentration/activity of all non-volatile components. This is particular the case when volume of the sample is relatively small.

5 Storage

Uncentrifuged samples or samples without separator gel can be stored at room temperature (+20 °C), when corresponding to the recommended storage for stability of the various parameters.

For longer storage time or unstable parameters, it is necessary to cool plasma to (+4 to +8°C); also prior separation of the bloods' cellular components is essential.

For longer storage time or unstable parameters, it is necessary to freeze plasma; also prior separation of the bloods' cellular components is necessary. Freezing of plasma tubes is possible to -20°C.

Please note that for certain analytes, the specimens should not be deep-frozen. Failure to observe this can result in deviating results for the following analytes:
Apolipoprotein A-I and B,
LDL-cholesterol.

Frozen samples should preferably be thawed at room temperature. Too rapid thawing by warming the sample may cause overheating and decomposition.
A very common source of error is the inadequate mixing of deep-frozen samples after they have been thawed. Concentration gradients are produced during thawing as the concentrated solution first melts and then runs down the side of the VACUETTE® tube.
After thawing, the sample should therefore be inverted several times, avoiding the formation of foam. Analysis must be performed immediately following thawing, as the stability of various factors may be reduced after thawing.

Please note that higher temperatures (including direct sunlight) must be avoided. Refreezing of previously thawed samples is not recommended.

6 Analysis

After centrifugation, samples may be transferred directly to the analyser. Ideally, the analyser needle takes the analytical sample by piercing the closed safety cap. In most laboratories, however, the safety cap has to be removed and the samples distributed. To prevent evaporation, this should be done shortly before analysis.

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