This invention relates to the treatment of blood for the purpose of preventing its coagulation. Hitherto magnesium ions or oxalate ions have been used for producing non-coagulating blood or plasma. Of both ions, however, rather high concentrations were required for preventing coagulation; there was also the further drawback of rather powerful toxic effects, which definitely barred the transfer of non-coagulating blood, prepared in this way, from the body of the dispensing person into the body of the diseased person in the case of blood transfusions. The minimum concentration of ions required for preparing non-coagulating blood by means of magnesium ions is calculated at two tenths millimole for 4 cm³, plasma or blood, and at 0.65 tenth millimole if oxalate ions are used.

It is an object of my invention to make it possible to carry out blood transfusions without danger of coagulation of the blood and while avoiding the addition to the blood of substances having a toxic effect.

Another object of my invention is to prevent the coagulation of blood by means of practically insoluble or difficultly soluble substances.

I have found that the metals of the rare earths and their difficultly soluble and insoluble combinations are especially adapted to prevent or check coagulation of the blood. The coagulation of the blood can be prevented or checked after it has been extracted from the body. This method of applying the process is of practical importance, e.g., for carrying out blood transfusions.

I have found that the effect of preventing blood coagulation may be obtained already by means of the metals of the rare earths themselves or by means of their difficultly soluble compositions; e.g., by this means that containers or conduits and similar conveyances contacting with the blood are used, which consist of, or are covered with, metals or difficultly soluble compositions of these metals.

This action of the metals of the rare earths or their difficultly soluble compositions is of practical importance, before all, when carrying out transfusions of blood, but also during other operations, where instruments and similar objects made from metal contact with the blood. By using syringes with injection pipes—if necessary also cylinder and piston—made from, or covered with, metal of the rare earths or of their insoluble compositions such as oxides, by transferring the blood through pipes or collecting it in beakers or similar containers made from, or covered with, the materials aforesaid, the coagulation of the blood is prevented owing to the described action of the earth metal ions. As is known to the art in view of other metals and the like, the instruments or accessory implements may be covered, e.g., with neodymium or the respective oxides, only at the surfaces contacting with the blood.

Non-coagulating plasma is prepared in this way, that the blood is extracted and is first made non-coagulating according to the aforesaid method and is separated from the not dissolved component parts by means of a centrifuge or by sedimentation or similar methods. A preferred method is to make the blood run directly into the centrifuge beaker made from, or covered with, the metals of the rare earths, and to subject the blood at once to the centrifuging process.

In the drawing accompanying this specification and forming part thereof, two receptacles are illustrated by way of example, which consist, according to my invention, of a rare earth metal at the points contacting with the blood.

Fig. 1 is a view of an injection syringe; Fig. 2 illustrates, by way of example, a centrifuge beaker adapted to the preparation of non-coagulating plasma or to collect the blood for the purpose of blood transfusion.

The receptacles are of the usual shape, differing, however, from those hitherto used in this respect that the injection pipe of the syringe consists of neodymium, and that the cylinder as well as the piston are covered with neodymium. The inside of the centrifuge beaker is also covered with metallic neodymium. In a similar way also the small pipes used, e.g., during blood transfusions are covered inside with a film of metallic neodymium. In this place of metallic neodymium also neodymium oxide may be used, which may be burnt onto a layer of another material.

It will be understood that the foregoing description is in illustration and not in limitation. Various alternative procedures may be adopted within the scope of the appended claims in which it is my intention to claim broadly all novelty inherent in the invention.

I claim:

1. The process of preventing the coagulation of blood or plasma in a container or the like comprising coating the inside surface of the container or the like with a substance selected from the group consisting of the rare earth metals and their difficultly soluble and insoluble compounds.
2. The process of preventing the coagulation of blood or plasma in a container or the like comprising coating the inside surface of the container or the like with metallic neodymium.

3. The process of preventing the coagulation of blood or plasma in a container or the like comprising coating the inside surface of the container or the like with neodymium oxide.

4. The process of preventing the coagulation of blood or plasma in a container or the like comprising providing the container or the like with an inside surface of a substance selected from the group consisting of rare earth metals and their difficulty soluble and insoluble compounds, and maintaining the blood or plasma in contact with the said inside surface.

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