

UNITED STATES PATENT OFFICE.

EMIL SCHEITLIN, OF BASEL, SWITZERLAND.

COMPOUNDS OF BLOOD OR ITS CONSTITUENTS AND PROCESS OF MAKING SAME.

Specification of Letters Patent. Patented Jan. 23, 1912.

1,015,641. Application filed May 10, 1911. Serial No. 626,236.

To all whom it may concern:

Be it known that I, EMIL SCHEITLIN, a citizen of the Swiss Confederation, and residing at Basel, Switzerland, have invented a certain new and useful Improved Compounds of Blood or Its Constituents and Process of Making Same, of which the following is a specification.

The subject-matter of my invention is a process of manufacturing compounds of blood or constituents thereof and aromatic sulfonic-acids.

I have found that by allowing aromatic sulfonic-acids *e. g.* guaiacol sulfonic acid, to act on blood or constituents thereof, I can obtain double compounds insoluble in water from the constituents of blood and the sulfonic-acid in question. I may add guaiacol sulfonic-acid as such, or I may liberate it from a mixture of blood or constituents thereof with sulfoguaiacate salts by means of stronger acids, when it subsequently acts *in statu nascendi*.

I may employ blood of various origin and various nature. The inorganic salts dissolved in blood are not, of course, capable of taking part in this reaction. My process is not limited to guaiacol-sulfonic acid but, so far as has been observed hitherto, may be carried into practice with the aid of any aromatic sulfonic-acid.

The new double compounds are obtained by mixing blood or constituents thereof until a distinct acid reaction is obtained with the sulfonic-acid at an ordinary temperature, and thereupon separating the precipitate obtained from the mother-lye.

New and therapeutically valuable products are obtained according to my invention. They differ particularly sharply from all combinations of albumin with therapeutically operative substances heretofore employed.

My process fundamentally differs from those described in the German Patents No. 84,551, Class 12 and No. 112,933, Class 30^b, because in these known processes it is a matter, on the one hand, of a coagulation process in the presence of citric acid, on the other hand, of the production of products split from blood by the action of powerful mineral acids. In contradistinction to these known processes, according to my invention all the valuable constituents of blood with the exception of the inorganic salts are obtained without a coagulation process and

without destruction in their genuine form as stable double compounds. It may be supposed that the aromatic sulfonic-acids anchor the Ehrlich's side chains of the albumin molecules and preserve these from the changes to which they are always subject in the known process (by a coagulation process or the action of acids). Further, it is generally well-known to bind therapeutically operative bodies to albumins, *e. g.* ovalbumin, blood albumin, in order to convert these into a form insoluble in gastric juice, so that the therapeutic action becomes operative only in the alkaline intestinal juice; compare, for example, the German patent specifications 100,707, 88,029, Class 30 and 162,636, Class 12^a, *Pharmazent. Centralhalle* 47 (1906), p. 354 under "Torosan" and Hager's *Handbuch der Pharm. Praxis*, supplementary volume (1908), pages 592 and 593 under "Pilulae Haemoglobini cum Guaiacolo." In contradistinction to these known processes, according to my invention I solve the problem of obtaining the constituents of the blood with the peculiarities peculiar to them by anchoring the albumin-like molecules in the blood with aromatic sulfonic-acids which, as such, are therapeutically indifferent, whereas in the above-mentioned known processes the albumin molecule solely serves as a protective envelop for the therapeutically operative substances. Also, a solution of sulfoguaiacate of potassium in blood serum is known and therapeutically employed. See Hager's *Handbuch der Pharm. Praxis*, supplementary volume 1908, page 12 under "Thiocolserum." This preparation is a simple mixture and no anchoring of the constituents of serum with guaiacol sulfonic acid takes place even under the action of the hydrochloric acid of the gastric juice because, as is known, the acids themselves are not liberated from the salts of aromatic sulfonic-acids by hydrochloric acid.

The new bodies are insoluble in water and in dilute acids, and dissolve very slowly and imperfectly in dilute alkalis; they are insoluble in organic solvents and give no characteristic reactions with albumin reagents, chlorid of iron, permanganate of potassium and silver nitrate solution.

The property of being insoluble in acids but soluble in alkalis, however, leads to the conclusion that the bodies pass the stomach undecomposed in order to be assimilated in the alkaline intestinal juice. The bodies are

unlimitedly durable, can be readily apportioned into doses and enable blood or constituents thereof which have been made specifically operative by inoculation by the production or enrichment of immune substances or anti-bodies to be administered through the mouth, whereas the known tuberculin preparations can only be therapeutically employed in the form of injections. Thus, for example, blood of bovine-vaccinated animals, anchored by aromatic sulfonic-acids, retains its antituberculin properties unchanged for a long time.

Example: An aqueous solution of guaiacol-sulfonic-acid is allowed to flow into a portion of fresh animal blood, defibrinated or not, at an ordinary temperature while agitating the same until the acid reaction to congo no longer disappears. The precipitated product is separated from the mother-lye, washed with water and dried at a temperature below 100° C.

I claim:—

1. The hereindescribed process of making compounds of blood and its constituents with aromatic sulfonic-acids, which comprises reacting on blood constituents with an aromatic sulfonic-acid.

2. The hereindescribed process of making

compounds of blood and its constituents with aromatic sulfonic-acids, which comprises reacting on blood constituents with an aqueous solution of guaiacol sulfonic-acid.

3. The herein described double compounds of a blood constituent and an aromatic sulfonic-acid, which are stable, insoluble in water, dilute acids and dissolve slowly in dilute alkalis, and give no characteristic reaction with albumin reagents.

4. The hereindescribed process, which comprises reacting on blood constituents of an inoculated animal with an aromatic sulfonic-acid, separating the precipitate and drying the same below the destructive temperature for the antitoxin.

5. The hereindescribed process, which comprises reacting on blood constituents of an inoculated animal with a guaiacol sulfonic-acid, separating the precipitate and drying the same below the destructive temperature for the antitoxin.

In testimony whereof, I affix my signature in the presence of two witnesses.

EMIL SCHEITLIN.

Witnesses:

SAMUEL HOLLINGER,
ARNOLD ZUBER.