

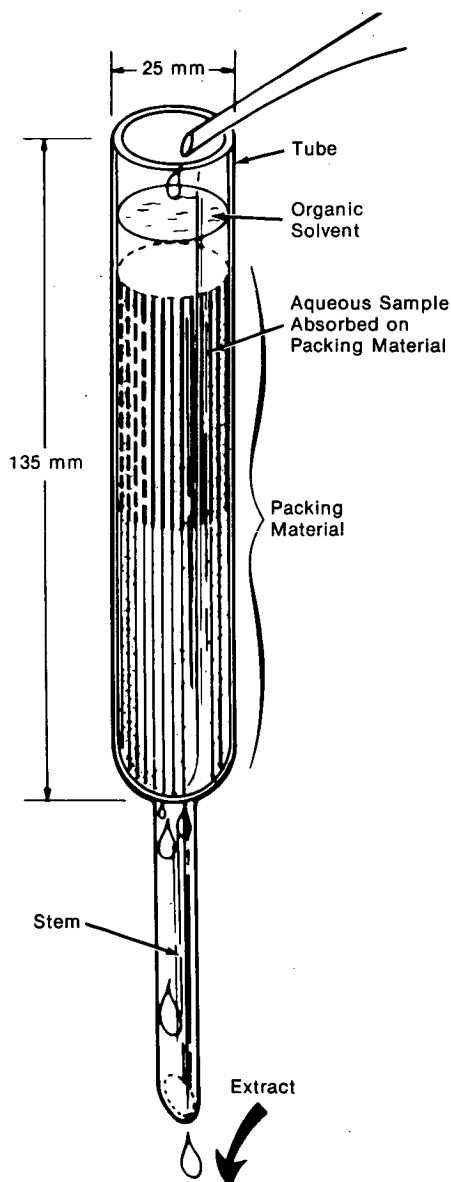
# NASA TECH BRIEF

*NASA Pasadena Office*



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## Improved Extraction Technique for Biological Fluids



Tube Used for Extraction of Biological Fluids

A new liquid-liquid extraction technique has been developed to speed up the separation of biological fluids into a number of compounds. This eliminates agitation, emulsion formation, centrifugation, the mechanical separation of phases, filtration, and other steps that have been used previously. The technique is to be used with the automated drug identification system described in NASA Tech Brief 74-10213 (NPO-13063).

In a typical case a blood or a urine sample taken from a patient is prepared into an aqueous solution of optimum pH. Separation is accomplished using a tube made of glass or polypropylene packed with ceramic wool, as shown in the illustration. Shredded filter paper, cellulose powder, absorbent cotton, and glass wool may also be used instead of the ceramic wool. In addition, the packing density may be different as required.

The specimen is poured into the tube, and a solvent/reagent is added. The extract leaves the tube via the tube stem into a vessel or duct provided for subsequent processing. The packing material absorbs much of the water from the specimen and spreads the specimen as a very thin film over a large area. This makes the drug-bearing components highly accessible for separation by interphasing with organic solvents such as chloroform carrying the desired reagents. In addition to its major function, the packing material filters particles from the sample and also serves as a drying mechanism. Extraction efficiencies are equal or better than current manual liquid-liquid extraction techniques.

(continued overleaf)

**Note:**

Requests for further information may be directed to:

Technology Utilization Officer  
NASA Pasadena Office  
4800 Oak Grove Drive  
Pasadena, California 91103  
Reference: TSP75-10045

**Patent status:**

Title to this invention has been waived under the provisions of the National Aeronautics and Space Act [42 U.S. C. 2457(f)], to the California Institute of Technology, Pasadena, California 91109.

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