

Sodium and Potassium ElectroFinder



Problem Statement: The biochemistry sector is one of the fastest-growing sectors in the Indian in-vitro diagnostics (IVD) industry. Currently, the biochemistry auto-analysers are the backbone of major diagnostic chains in the country. Biochemistry analysers are used in all laboratories, from small PoC to high-throughput clinical labs, to test analytes such as proteins, enzymes, and electrolytes. Benchtop analysers are the most common type, but compact bedside models, usually with fewer test options, and high-throughput floor-based units are also available. A few major multinational companies dominate the biochemistry market in India. Manufacturers are developing analysers with low volume reagent consumption. This work by researchers handles the design and development of a Blood Electrolyte quantification device for human blood samples and assays for the same. The researchers have developed a technology to make the blood test for sodium and potassium rapid and cost-effective using a compact instrument.

Uniqueness of the Solution: The researchers have developed a point-of-care optical reader to quantify liquid-based sodium and potassium assays. This optical reader is implemented on the principle of absorbance and scattering of light in liquid solutions. The researchers implemented the electronic architecture of the reader from the breadboard level to the printed circuit board level in order to miniaturise the optical reader. The device utilises the principles of turbidimetry and nephelometry to quantify the electrolyte present in the sample.

Current Status of Technology: The researchers have completed building the prototype. The product is also tested with a large number of clinical samples at the KEM Hospital, Mumbai.

Societal Impact: The proposed technology will decrease the cost of sodium and potassium blood tests by 50 INR per test. Also, it needs only 10 μ l of serum sample and 60 seconds per test

to reduce the turnaround time per test, which is useful in facilities with limited resources like primary health centres, ambulance services, disaster sites and rural healthcare centres.

Patent(s): Filed

Relevant Industries: Healthcare, Medical Devices, Digital Health Monitoring.

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