Institute of National Analytical Research and Service (INARS)

BCSIR Water Hardness Test Kit



The BCSIR Water Hardness Test Kit is a rapid, simple, portable, and cost-effective analytical kit developed for the determination of total water hardness due to calcium (Ca^{2+}) and magnesium (Mg^{2+}) ions. The test is based on a complexometric titration principle using EDTA and a suitable indicator under controlled pH conditions. The hardness is determined and expressed as mg/L (ppm) as $CaCO_3$.

Problem being addressed	Conventional laboratory hardness testing can require laboratory facilities, glassware, reagents and trained personnel. A simple field-oriented kit is needed for rapid routine screening and monitoring.
Primary applications	Determination of total hardness in drinking and treated water, groundwater, surface water, industrial process water, boiler and cooling water, and RO feed/treated water.
Potential users/ customers	➢ Water-treatment plants and service providers ➢ Industrial plants and boiler/cooling-water operators ➢ Environmental monitoring organizations ➢ Laboratories and research organizations
Development status	The process for the preparation of the Water Hardness Test Kit has been accepted and is ready for commercialization.
Testing and validation	The performance of the BCSIR Water Hardness Test Kit was evaluated against a standard laboratory EDTA titration method for accuracy, precision, repeatability, and recovery.
Technical advantage	Portable, simple visual endpoint, requires a small sample volume, needs no sophisticated instrument, provides rapid results, and is economical for routine testing. Two measurement ranges are available: low range (0–30 mg/L as $CaCO_3$) and high range (0–300 mg/L as $CaCO_3$).
Raw materials	EDTA, Hardness buffer, Hardness indicator, Glass beaker, Syringe and suitable packaging.
Production process and equipment	Reagent preparation and standardization → filling→ kit assembly → labeling → quality control → final packaging. Equipment includes analytical balance, volumetric flask, glassware, mixing machine, dispensing instrument and basic QC facilities
Indicative economics	For a production volume of 10,000 kits, the indicative selling price is BDT 1,000 per kit.
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