National Centre for Compositional Characterization of Materials (NCCCM), Bhabha Atomic Research Centre (BARC) Hyderabad, India

प्रमाणित निर्देशक द्रव्य

Certified Reference Material

Major and Minor Constituents in Tea Powder

Reference Material Certificate

BARC D3201

Certified Reference Material (CRM) of tea for major and minor constituents (K, Ca, P, Mg, Mn, Al, Fe, Ba, Zn, Cu, Sr, Pb, As, Cd, and Hg) is intended for use as a calibration standard in evaluating analytical methods and the performance of instruments for the determination of elements. This CRM can also be used for data quality control (DQC) in the routine analysis of tea powder. One bottle of this CRM contains 20g of the tea powder in a amber colour glass bottle.

The tea powder material for major and minor constituents has been certified by the consensus of a network of laboratories by means of an inter laboratory comparison exercise (ILCE) as given in table below. The results are referred to the dry material (1g) corrected for moisture at 85˚C for 5 h. Analytical techniques used for the determination of major and minor constituents in tea powder by the participant laboratories include inductively coupled plasma atomic emission spectrometry (ICP-AES), graphite furnace atomic absorption spectrometry (GFAAS), inductively coupled plasma mass spectrometry (ICP-MS), atomic fluorescence spectrometry (AFS), and Hydride Generation Atomic Absorption Spectrophotometry (HGAAS). This tea certified reference material (CRM) was produced in accordance with the ISO 17034: 2016 and ISO 17025:2017. Assigned property values were established according to ISO Guide 35:2017 guidelines.

Analyte	Certified Values[1]	Expanded uncertainty[2] (k =2)	Units
Ca	0.458	0.025	% m/m
K	1.99	0.139	% m/m
P	0.303	0.031	% m/m
Mg	0.225	0.014	% m/m
Mn	1150	75.0	mg kg^{-1}
Al	1033	94.0	mg kg^{-1}
Fe	431	29.5	mg kg^{-1}
Ba	44.7	2.3	mg kg^{-1}
Zn	25.5	1.1	mg kg^{-1}
Cu	19.1	0.79	mg kg^{-1}
Sr	15.3	1.27	mg kg^{-1}
Pb	3.45	0.31	mg kg^{-1}
Cd	1.27	0.11	mg kg^{-1}
Hg	0.60	0.084	mg kg^{-1}
As*	1.45	0.36	mg kg^{-1}

The given uncertainty of the certified value is at a confidence level 95% (Coverage factor k = 2)

[1] ISO 13528 (2015): Statistical methods for use in proficiency testing by inter-laboratory comparison, [2]ISO 35: 2017 guidelines, * Indicative value