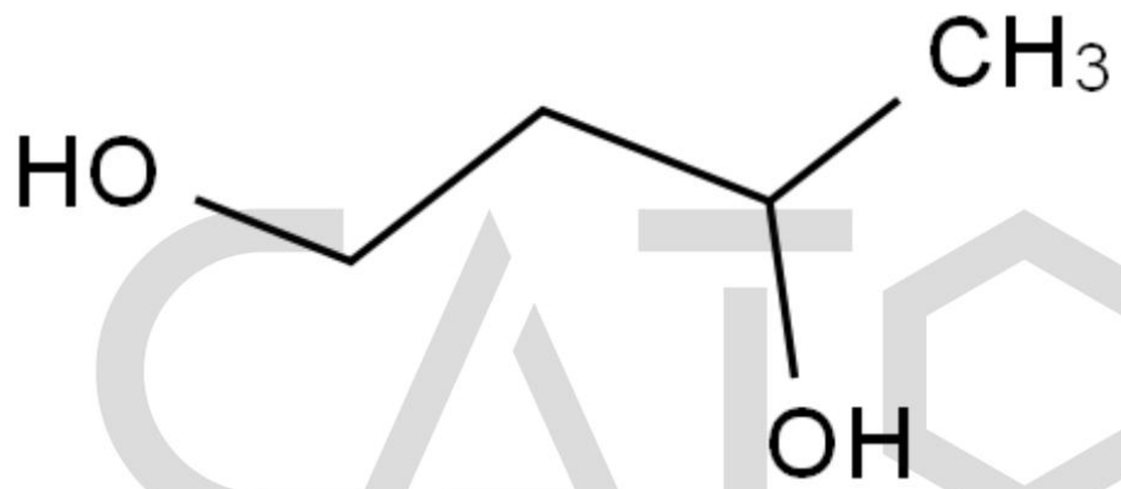
Certificate of Analysis

Reference Material & Standard

Product Name:	1,3-Butanediol	**Catalogue Number:**	CCEM500048
Synonyms:	N/A	**Lot Number:**	0527-RD-0041
CAS Number:	107-88-0	**Expiry Date:**	Oct 16, 2029
Molecular Formula:	$C_4H_{10}O_2$	**Storage:**	2°C ~ 8°C Protected from light and Sealed
Molecular Weight:	90.12	**Shipping Condition:**	Shipping at Room Temperature
		Warning:	

Chemical Structure:



Test Items	Method	Results
Appearance	Visual inspection	Colourless Sticky Liquid
Identification	GCMS&CNMR&HNMR	Confirmed
Purity	GC	98.434%
Water Content	Karl Fischer	0.3082%
Assay		98.1%
Uncertainty		±0.4%

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Comment:

1. The calculation of the mass balance method follows the formula (calculated on the non-dried basis):
*Assay (%) = (100%-Water Content) * Purity GC (%) /100%*
Water Content is considered as absolute effect, GC purity is considered as relative effect.
2. The uncertainty values are the expanded uncertainty and represent an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.

Signature:

Prepared by: Lisa Date: Oct 17, 2025

Reviewed by: Hinlam Date: Oct 17, 2025

Approved by General Manager: David Date: Oct 17, 2025

CATO Research Chemicals Inc.