

Certificate of Analysis

Product name	HAp(P) Microsphere	Lot No.	Sample
Quantity	5 g	Grade	20 – 45 μm
Date of Manufacture	Sample	Date of Issue	-

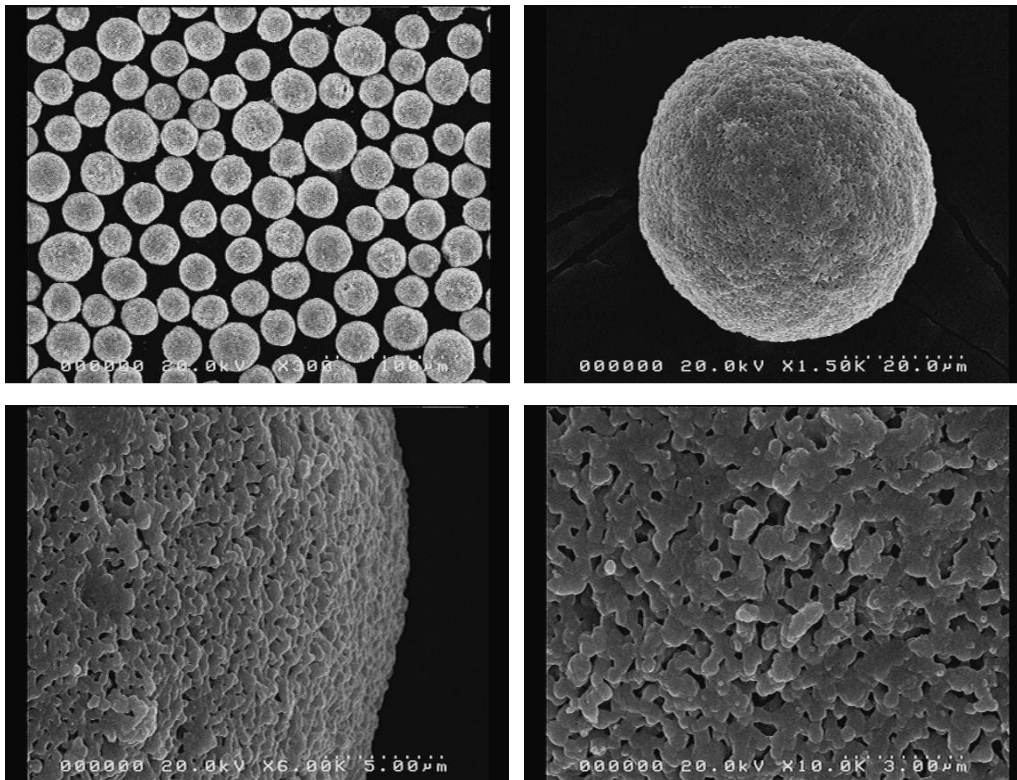
Test items	Test Method	Specification	Results
Appearance	Sensory test	White powder	White powder
Odor	Sensory test	Odorless	Odorless
Morphology	SEM observation	Spherical	Spherical
pH	Internal specifications	6.5 – 8.5	≤ 8
Impurities			
1) Arsenic (As)	ICP measurement	$\leq 3 \text{ ppm}$	$\leq 1 \text{ ppm}$
2) Cadmium (Cd)		$\leq 5 \text{ ppm}$	$\leq 0.5 \text{ ppm}$
3) Mercury (Hg)		$\leq 5 \text{ ppm}$	$\leq 0.05 \text{ ppm}$
4) Lead (Pb)		$\leq 30 \text{ ppm}$	$\leq 1 \text{ ppm}$
Total heavy metals		$\leq 30 \text{ ppm}$	Conform
Particle size distribution (20-45 μm fraction)	Laser diffraction (PSA)	$\geq 70 \text{ vol } \% \text{ between}$ 20 and 45 μm	Conform
True density	Gas pycnometer	$\geq 3.0 \text{ g/cc}$	Conform
HAp content	XRD analysis	$\geq 95 \%$	Conform
CaO content	XRD analysis	$\leq 1 \%$	Not detected
Foreign phases content (α -TCP, β -TCP, TTCP, CaO)	XRD analysis	$\leq 5 \%$	Not detected
Ca/P ratio	XRD analysis	1.66 – 1.71	1.67

Shelf Life 5 years from the date of manufacture.

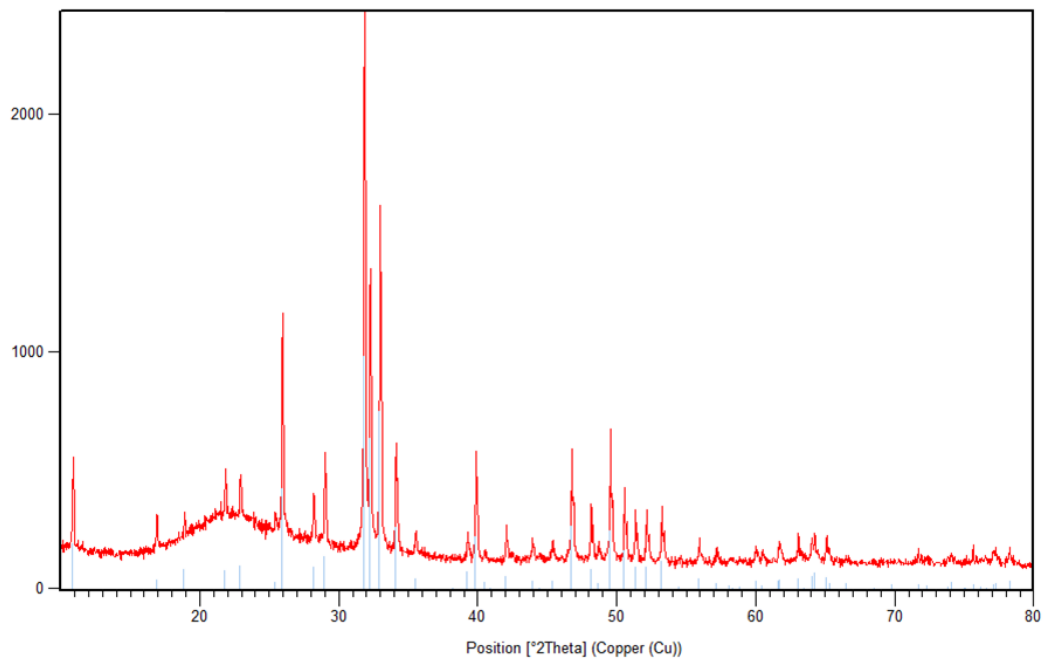
Storage Store in a cool, dry place. Avoid exposure to heat and moisture.

COA Issuer JSTechLab

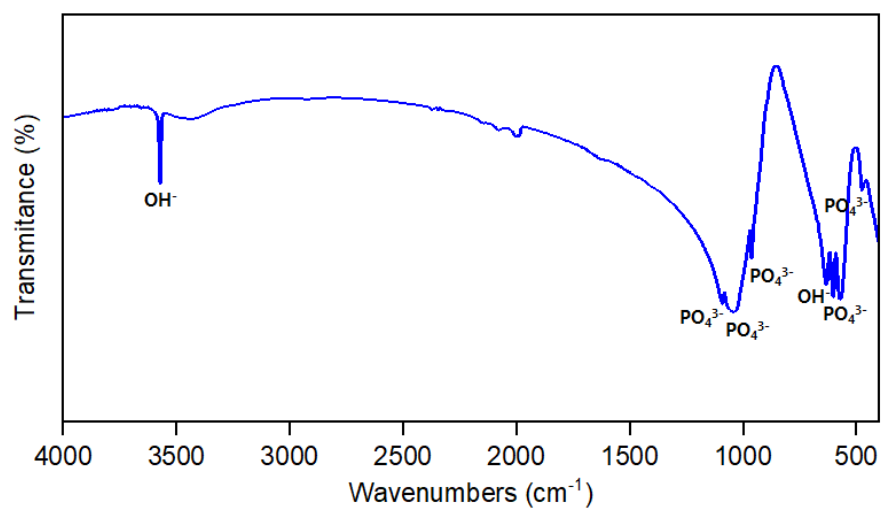
Notice The analytical results are provided for sample submission purposes only.



[SEM images]



[XRD pattern]



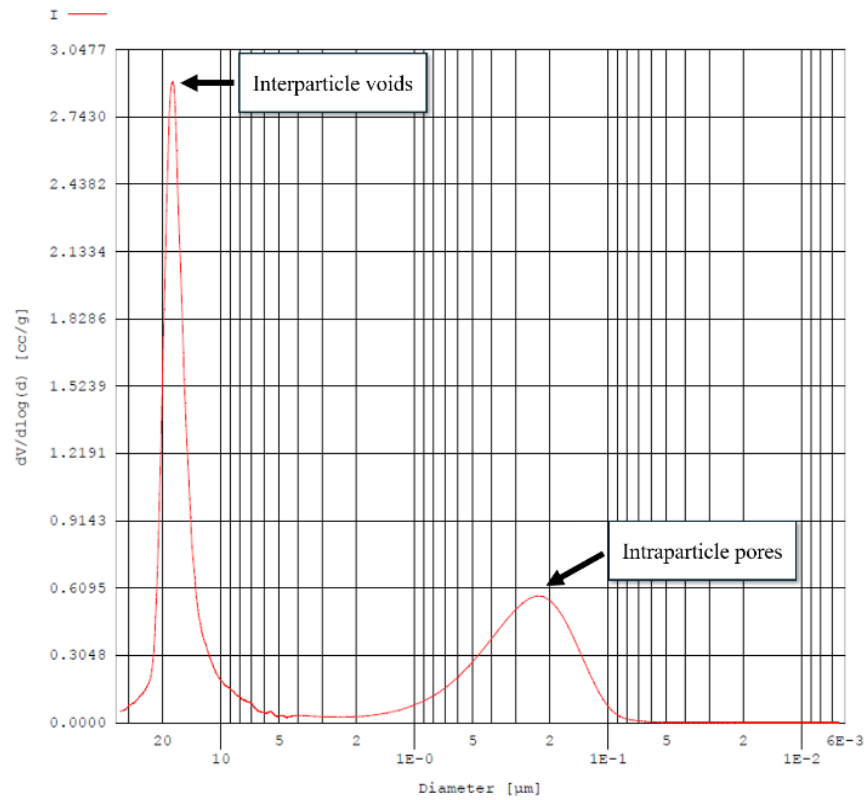
[FT-IR spectrum]

Summary Statistics	Measured Value (g/cm ³)	Test method
Average	3.14	(1) Instrument: Micromeritics AccuPyc II 1340 (2) Analysis gas: Helium (3) Number of purges: 5 (4) Purge fill pressure: 19.5 psig (5) Cycle fill pressure: 19.5 psig (6) Rate: 0.005 psig/min (7) Analysis temperature: (23 ± 2) °C

[True density]

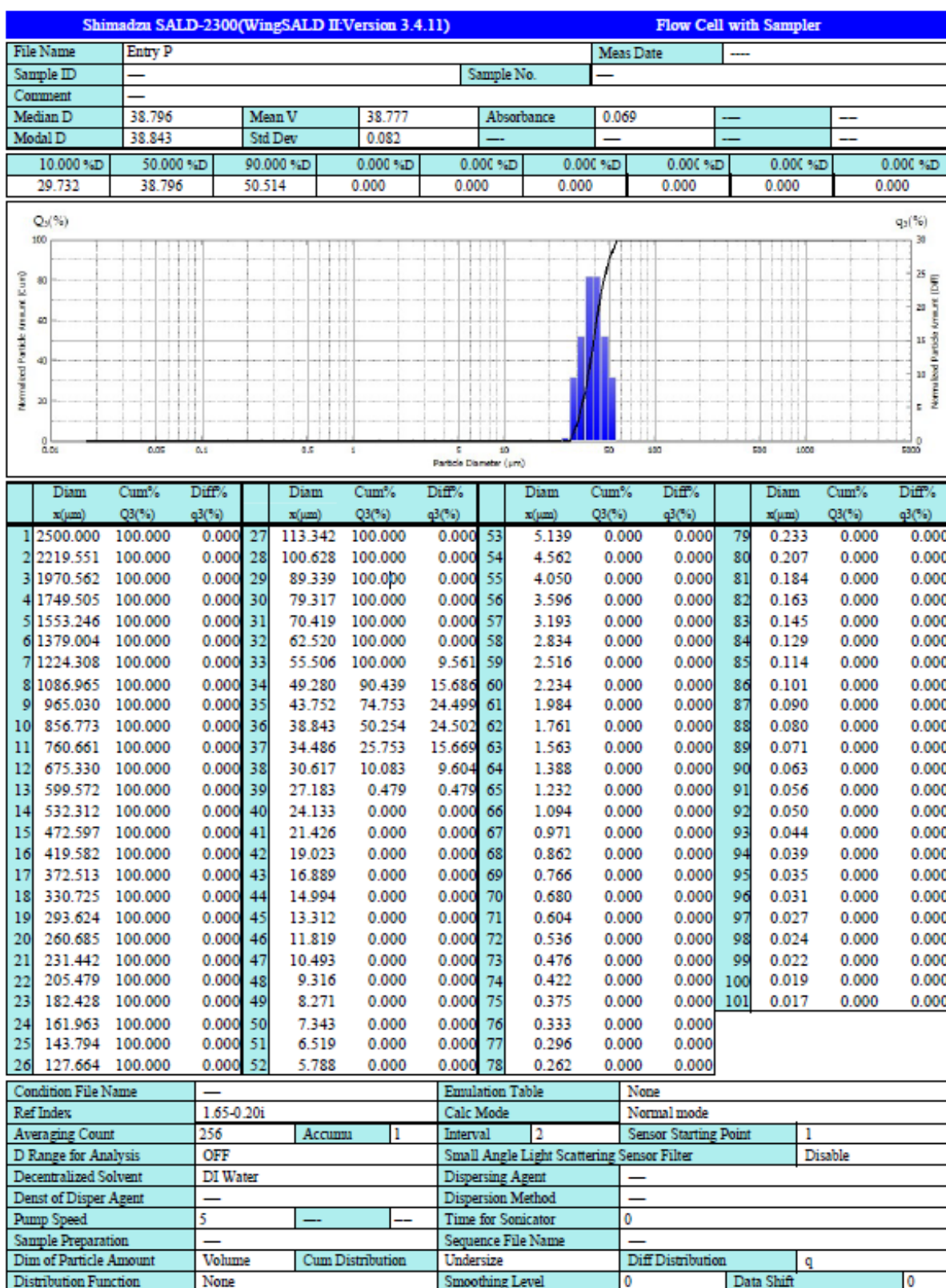
Property	Measured Value (g/cm ³)
Bulk Density	0.71
Tapped Density	0.83

[Bulk & tapped density]



Porosity Type	(%)
Interparticle	36.8
Intraparticle	29.0

[Pore Size Distribution (MIP)]



[Particle Size Distribution]

