

SHANDONG GUANGHAO BIOLOGICAL PRODUCTS CO., LTD  
 山东广昊生物制品有限公司

**CERTIFICATE OF ANALYSIS**

Product Name	Chondroitin Sulfate (Porcine)
Batch Number	CS20171020
MFG. Date	Oct. 20, 2017
EXP. Date	Oct. 19, 2020
Country of Origin	China

Items of Analysis	Specification	Results
Assay by CPC (dry basis)	≥ 90%	98.5%
Assay by CPC (as is)	Report (as is)	89.63%
Assay by EHPLC (dry basis)	≥ 90%	100.0%
Assay by EHPLC (as is)	Report (as is)	91.0%
Loss on drying	≤ 10%	9.0%
Description	White to off-white powder	Complied
Particle Size	Pass 80 mesh	80 mesh
Limit of Protein	≤ 6.0%	2.31%
Heavy Metals	≤ 10 µg/g	Complied
pH	5.5 – 7.5	6.6
Specific Rotation	-20.0° – -30.0°	-22.60°
Residue on Ignition	20.0% – 30.0%	25.6%
Chloride	≤ 0.5%	Complied
Sulfate	≤ 0.24%	Complied
Total Bacterial Count	≤ 1,000 cfu/g	Complied

Conclusion: This batch of product meets **USP39** standard.



# ANALYTICAL LABORATORIES IN ANAHEIM, INC.

2951 Saturn Street Unit C, Brea, CA 92821 Ph: (714)524-9988 Fax:(714)524-9926  
Website: <http://www.analytical-lab.com>

Receive Date: 12-08-2017

Report Date: 12-21-2017

Job#: Sample: RW00B38, Chondroitin Sulfate (Porcine)  
105922  
Lot#: CS20171020

Analysis	Result (as is)	Result (dry base)
Chondroitin disaccharide $\Delta$ di-4S sodium salt	64.8%	
Chondroitin disaccharide $\Delta$ di-6S sodium salt	12.7%	
Chondroitin disaccharide $\Delta$ di-0S sodium salt	3.43%	
Total Chondroitin disaccharide	80.9%	88.7%
(Equivalent to USP Chondroitin Sulfate Reference Standard)		
Chondroitin Sulfate A	75.3%	
Chondroitin Sulfate C	14.8%	
Nonsulfate chondroitin	3.99%	
<b>Total Chondroitins (Enzymatic HPLC)</b>	<b>94.1%</b>	<b>103%</b>
Loss on Dry	8.76%	

Method: ALC150A (Enzymatic-HPLC);

Chondroitin disaccharide di-0S sodium salt, Sigma C3920 010M1203

Chondroitin disaccharide di-4S sodium salt, Sigma C4045 010M1206

Chondroitin disaccharide di-6S sodium salt, Sigma C4170 098K1122

USP Reference Standard: cat# 1133570, lot# R039A0

Dry condition: 105 C for 4 hours.

Technical Review:

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Management Review:

*[Signature]*  
2/1/17



# ANALYTICAL LABORATORIES IN ANAHEIM, INC.

2951 Saturn Street Unit C, Brea, CA 92821 Ph: (714)524-9988 Fax:(714)524-9926  
Website: <http://www.analytical-lab.com>

Mid-West Nutrition, Inc.  
925 W. 6th St.  
Fremont, NE 68025  
Tel: (402)721-7347 Fax: (415)329-1920  
Job#:            Sample: Chondroitin Sulfate  
104317  
Lot#: CS20171020

Receive Date: 10-30-2017  
Report Date: 11-20-2017

Analysis	Result (as is)	Result (dry base)
Chondroitin disaccharide Δdi-4S sodium salt	65.5%	
Chondroitin disaccharide Δdi-6S sodium salt	13.0%	
Chondroitin disaccharide Δdi-0S sodium salt	3.25%	
Total Chondroitin disaccharide	81.8%	89.3%
(Equivalent to USP Chondroitin Sulfate Reference Standard)		
Chondroitin Sulfate A	73.6%	
Chondroitin Sulfate C	14.6%	
Nonsulfate chondroitin	3.65%	
<b>Total Chondroitins (Enzymatic HPLC)</b>	<b>91.9%</b>	<b>100%</b>
Loss on Dry	8.40%	

Method: ALC150A (Enzymatic-HPLC);  
Chondroitin disaccharide di-0S sodium salt, Sigma C3920 010M1203  
Chondroitin disaccharide di-4S sodium salt, Sigma C4045 010M1206  
Chondroitin disaccharide di-6S sodium salt, Sigma C4170 098K1122  
USP Reference Standard: cat# 1133570, lot# R039A0  
Dry condition: 105 C for 4 hours.

Technical Review:

*[Signature]* 20 Nov 17

Management Review:

*[Signature]* 20 Nov 17