



Modena, 15.05.2019

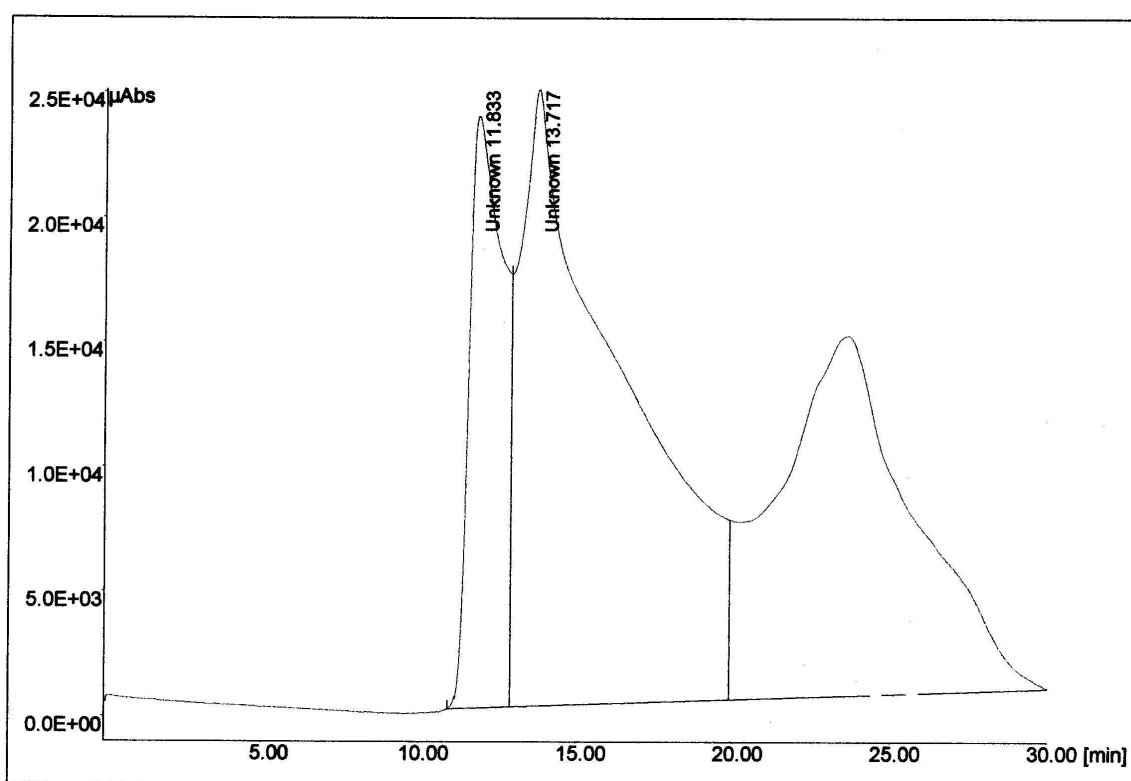
ANALYTICAL REPORT

Various chondroitin sulfate (CS) samples have been analysed for the molecular mass and profile by means of HPSEC [Volpi N. and Bolognani L. *J. Chrom. A.* 630, 390, 1993. Volpi N. *J. Chrom., Biomed. Appl.* 622, 13-20, 1993. Volpi N. *Recent Res. Devel. Biochem.*, 3 Part II, 2002. High Performance liquid chromatography in biochemistry. Henschen A., Hupe K.P., Lottspeich F. and Voelter W. Eds., VCH, 1985], for the pattern of unsaturated disaccharides by using SAX-HPLC [Volpi N., Mascellani G., Bianchini P. and Liverani L. *Il Farmaco*, XLVII, 47(suppl. 5), 841-853, 1992. Volpi N. *Carb. Res.*, 247, 263-278, 1993. Volpi N. *Bollettino Chimico Farmaceutico (BCF)*, 132, 153-160, 1993. Volpi N., Sandri I. and Venturelli T. *Carb. Res.* 279, 193-200, 1995. Volpi N. *The polymeric materials encyclopedia.* 144-152, 1996. Volpi N. *Analyt. Biochem.*, 273, 229-239, 1999. Volpi N. *Analyt. Biochem.*, 277, 19-24, 2000. Volpi N. *Carb. Polym.*, 55, 273-281, 2004], and for the content and purity by agarose-gel electrophoresis [Volpi N. *Carb. Res.*, 247, 263-278, 1993. Volpi N. *Analyt. Biochem.* 218, 382-391, 1994. Volpi N. *Analyt. Biochem.*, 273, 229-239, 1999. Volpi N. *Recent. Res. Devel. Anal. Biochem.*, 1, 49-54, 2001. Maccari F. and Volpi N. *Electrophoresis*, 23, 3270-3277, 2002. Volpi N. and Maccari F. *Electrophoresis*, 23, 4060-4066, 2002].

	<p><i>Università degli studi di Modena e Reggio Emilia</i> DIPARTIMENTO di LIFE SCIENCES Via Campi 213/D Tel. 0039 (0)59 2055543; Fax 0039 (0)59 2055548; e-mail: volpi@unimo.it</p>	
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Sample Batch 20190320

The sample has been analyzed by HPSEC for the determination of the molecular mass and chromatographic profile.



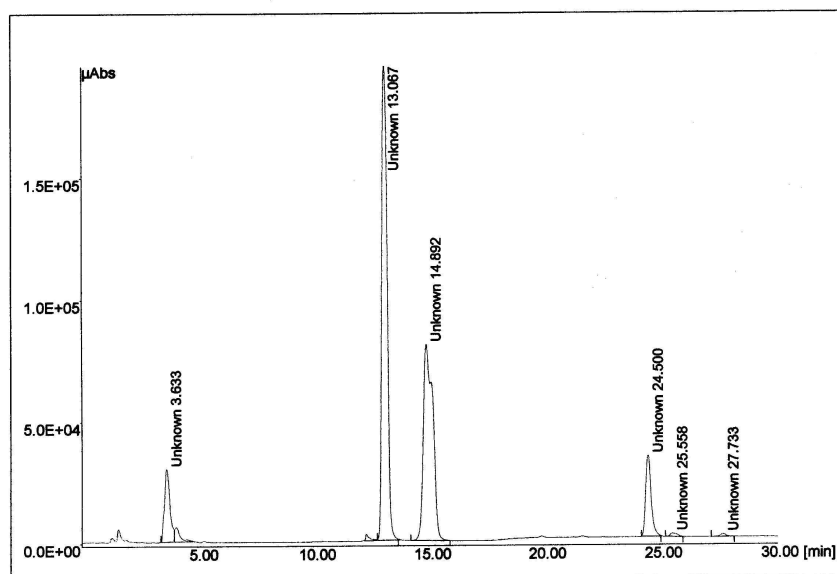
The sample has been analyzed by SAX-HPLC for the determination of the unsaturated disaccharides.



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HPSEC 1	HPSEC 2	SAX-HPLC	CS CONTENT
MW _n = 212250	MW _n = 28900	0s = 6.4	Agarose-gel = 91.5% w/w
MW _w = 262890	MW _w = 30990	6s = 43.0	SAX-HPLC = 90.6% w/w
Dispersity = 1.2385	Dispersity = 1.0723	4s = 41.7	
		2,6dis = 8.0	
		4,6dis = 0.4	
		2,4dis = 0.5	
		Charge density = 1.03	
		4s/6s = 0.97	

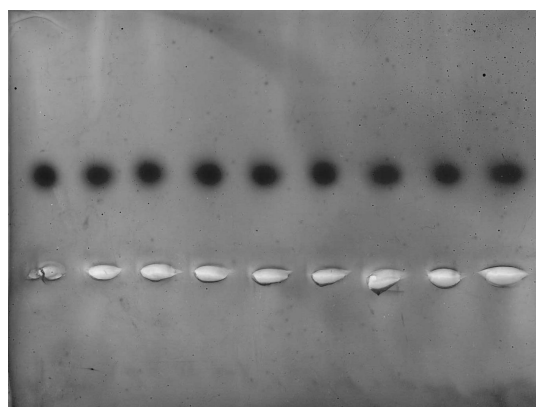
CS sample of ICHTHYIC origin (from SHARK CARTILAGE). PRESENCE OF TWO PEAKS RELATED TO TWO SPECIES WITH DIFFERENT MOLECULAR WEIGHT



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Standard 0912 0912 Standard

CS Standard = European CS Pharmacopeia Standard >98% pure.

Prof. Nicola Volpi

University of Modena and Reggio Emilia

Via Campi 213/d, 41100 Modena, Italy

Dr.ssa. Francesca Maccari

University of Modena and Reggio Emilia, Italy