



ZEOCHEM®

Insulin Purification with ZEOsphere® C18

Insulin

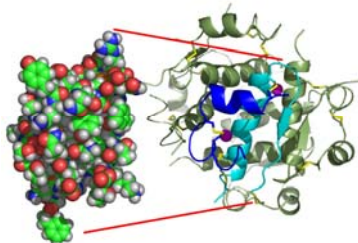
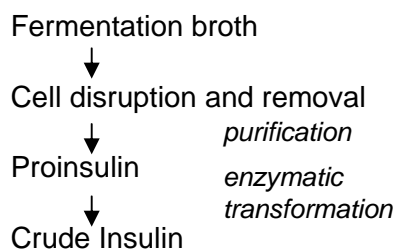


Figure 1: insulin structure⁽¹⁾

Insulin is a very important hormone of the human body. It is widely used for the treatment of diabetes mellitus disease⁽²⁾.

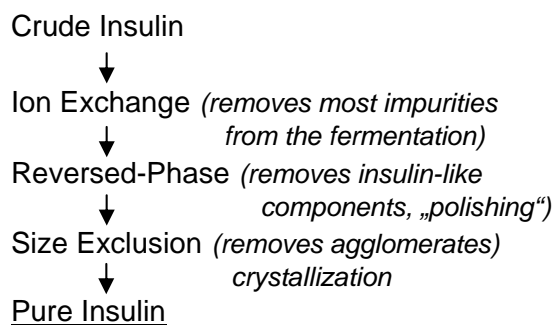
Insulin Production

Nowadays, insulin is mainly produced via Proinsulin using fermentation of recombinant micro organisms (*E. coli*)⁽²⁾.



Insulin Purification

The insulin purification involves different chromatographic (IEX, RP, SEC)⁽³⁾ and crystallization steps:



- (1): X. Chang, A.M. Jorgensen, P. Bardrum, J.J. Led
 (2): M.R. Landish et al, *Biotechnol. Prog.* **8** (1992) 469
 (3): E.P. Kroeff et al, *J. Chromatogr.* **461** (1989) 45

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The „Polishing“ Step

Insulin-like components (desamido-, carbamoyl-, formyl-insulin and other forms), represent 6 to 20% of the fermentation mixture and are the most difficult molecules to be separated. This purification is usually done with reversed-phase chromatography⁽³⁾.

Desamido-insulin can efficiently be separated from insulin with ZEOsphere® 100 C18 15 µm

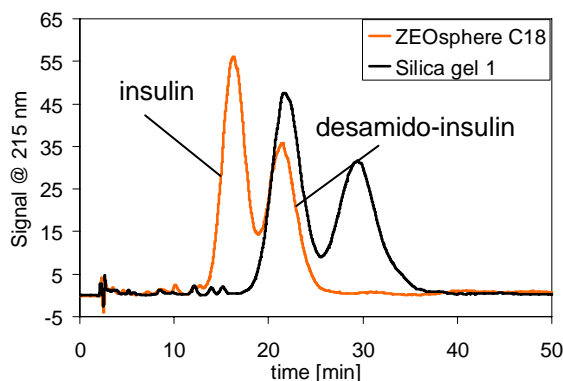


Figure 2: insulin, desamido-insulin separation on ZEOsphere 100 C18 15 µm and on Silica gel 1. Mobile phase: EtOH : 50 mM (NH₄)₂SO₄, pH 3.5, 28.3% : 71.7% (w/w); 25°C

Column Regeneration

After intense use, irreversibly bonded molecules have to be removed from the material. This can often be done only with cleaning in place with a NaOH/organic modifier solution (for more information refer to the “ZEOsphere® C8 stability under CIP conditions” leaflet).

Ordering Information

Appropriate for the insulin purification are the following Zeochem materials: ZEOsphere® C8 and C18, with 100 - 200 Å pore diameter and particle size of 10 - 15µm.

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