How to improve a peptide purification process?

The objective for process developers in preparative LC is the isolation of a target compound with a maximum sample recovery in the shortest cycle time within cost limitations. For the development of a highly efficient peptide purification process, the following technical aspects are relevant:

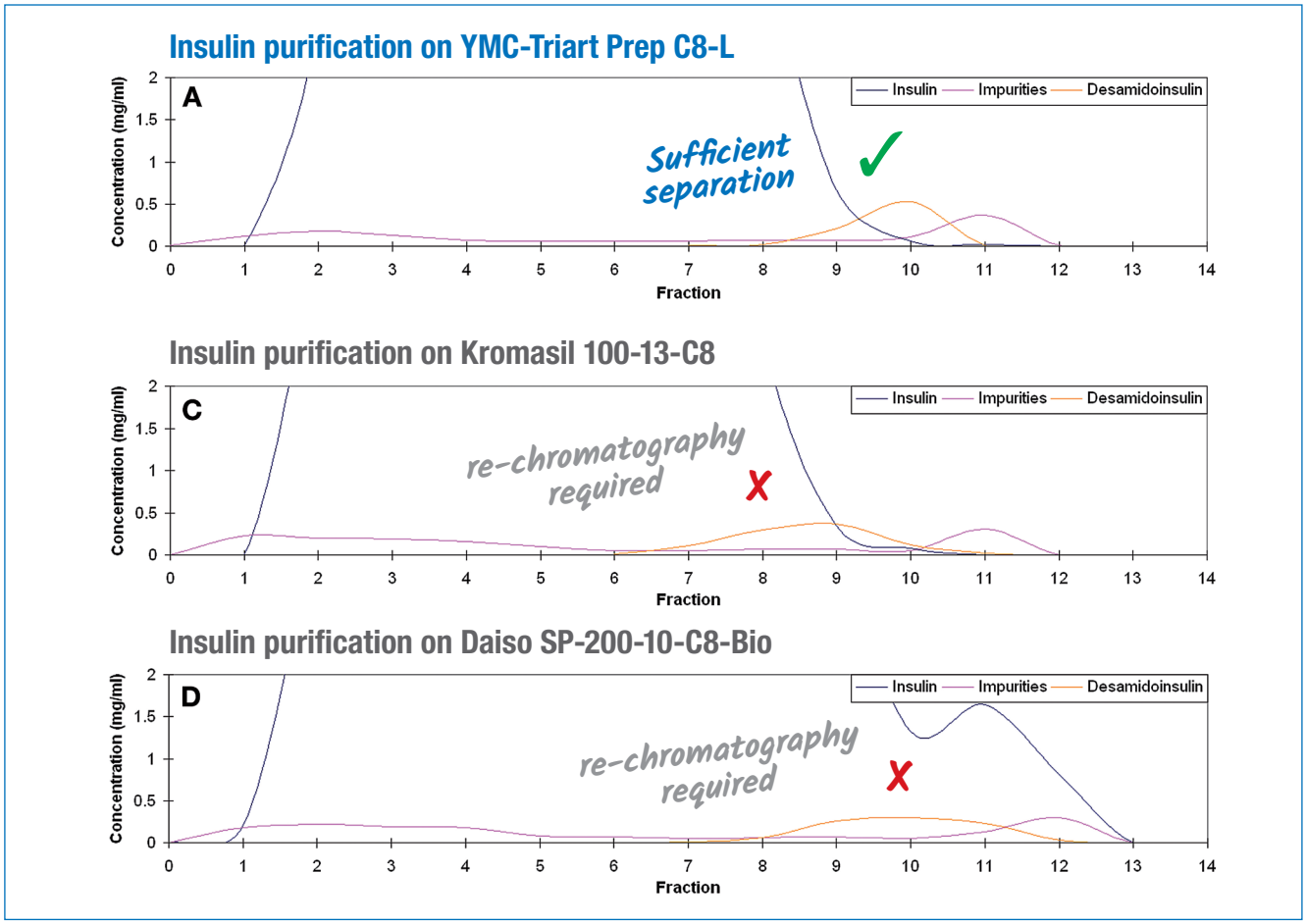
- **Optimal selectivity**
- **Maximum loadability and recovery**
- **Long lifetime**

The optimal selectivity, in particular the ideal combination of the most suitable stationary phase and elution conditions, is the basis of every economic preparative separation. Only the optimal selectivity will allow the highest productivity: the maximum loading capacity and yield in the shortest cycle time. Consequently, preparative grade phases combining these qualities represent the next generation for more efficient and productive preparative processes.

YMC-Triart Prep phases

1. Optimal selectivity for peptides

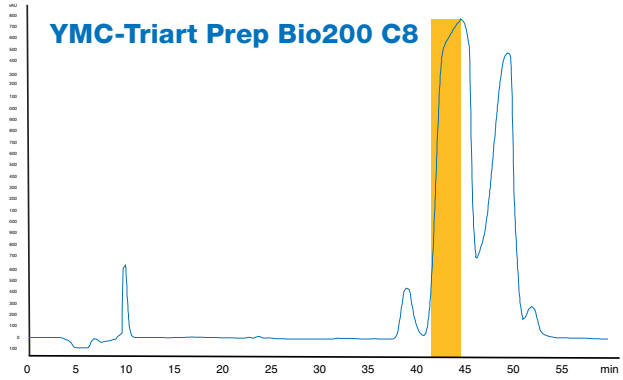
The selectivity has the most significant influence upon the resolution of a separation. Therefore, it is an essential step to screen different stationary phase chemistries. In combination with the most suitable stationary phase and elution conditions, a very economic preparative separation can be obtained. Only the optimal selectivity will allow the highest productivity; that is the maximum loading capacity and yield in the shortest cycle time.

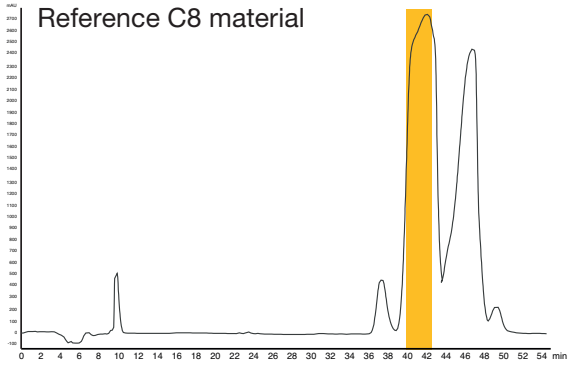


2. Maximum loadability and recovery

The effective loadability has a strong impact on the final productivity of every purification process. The loadability depends on the properties of the stationary phase and the target compounds.
The new YMC-Triart Prep Bio200 C8 was compared to a reference C8 phase. The benefits of the new phase are obvious at increased loadings. While other phases fail to deliver a fraction with sufficient purity, the new YMC phase still achieved the required resolution and target fraction purity.

Loading: 8 mg





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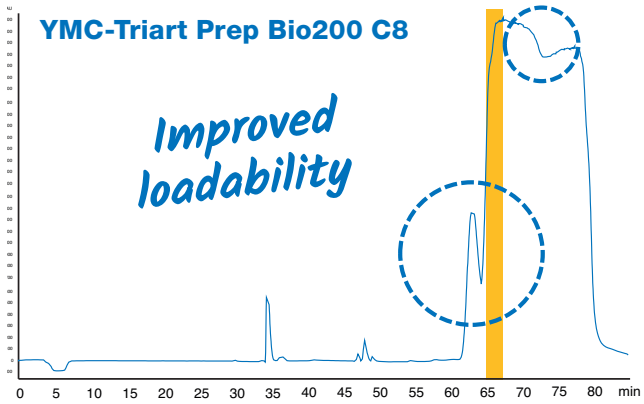
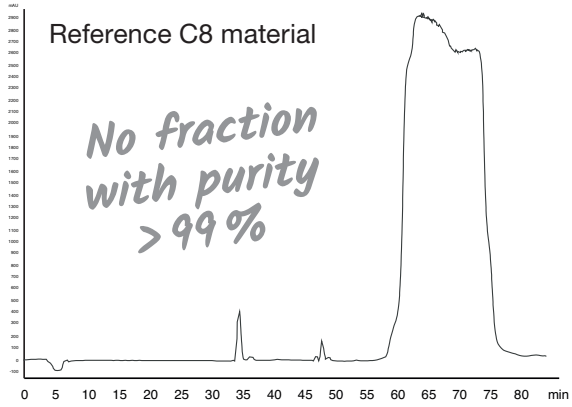




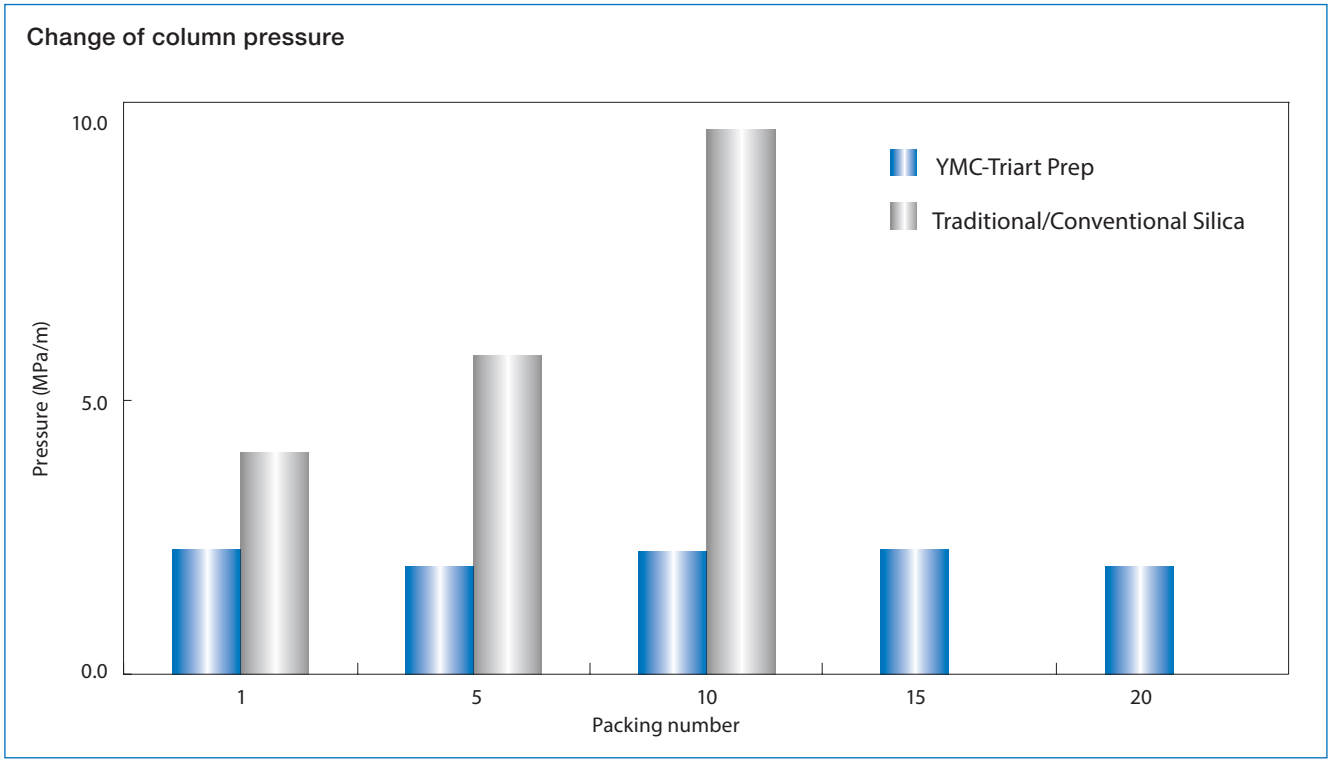
Fraction with ≥ 99% purity of target

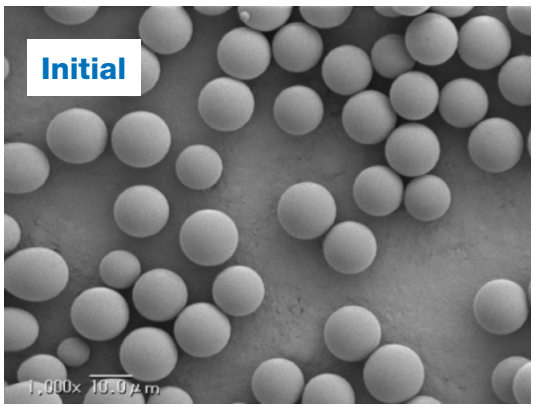
Column Size:	250 x 4.6 mm ID
Eluent:	A) buffer*/acetonitrile (90/10)
	B) buffer*/acetonitrile (60/40)
Gradient:	0%B (0-5 min) 0-45% (5-10 min)
	45–55% (10–58 min) 100%B (58–100 min)
Flow rate:	1.0 mL/min
Temperature:	ambient
Detection:	UV at 214 nm
Sample:	insulin in 0.1 N HCl left at 40 °C for 16 hr
Sample conc.:	2 mg/mL in 0.1% CH_3COOH (Insulin purity about 75 %)
buffer:	20 mM CH_3COONH_4-CH_3COOH, 200 mM $(NH_4)_2SO_4$ (pH 4.5)

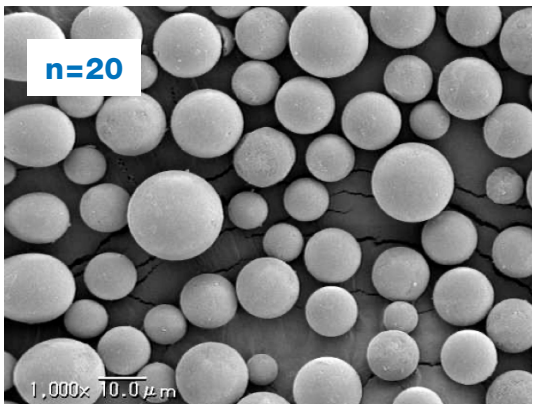
3. Long stationary phase lifetime

The lifetime of a stationary phase directly affects the economics of the preparative purification process. The YMC-Triart Prep phases are based on a hybrid-silica material. This base material ensures an enhanced mechanical and chemical stability.

Mechanical stability



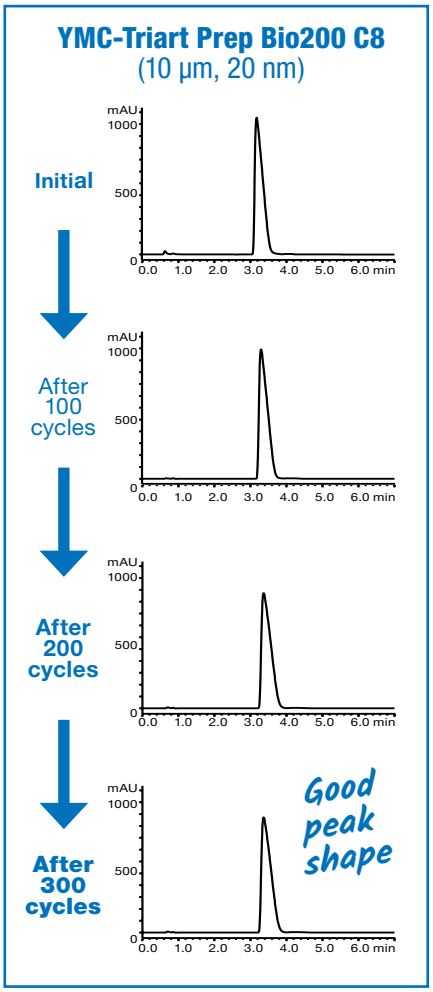


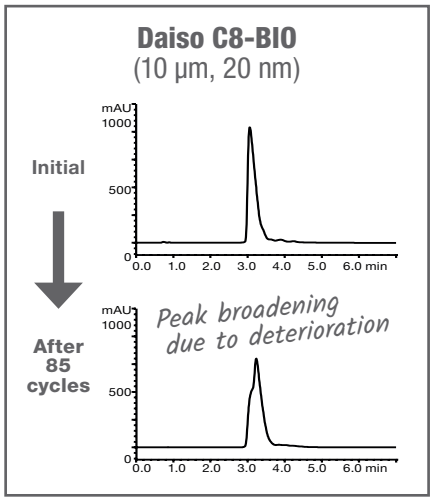


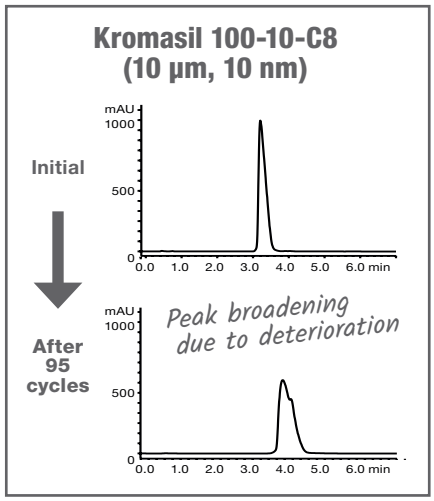
SEM pictures of the material before the first packing and after the 20th packing prove the high mechanical stability of the YMC-Trairt Prep materials.

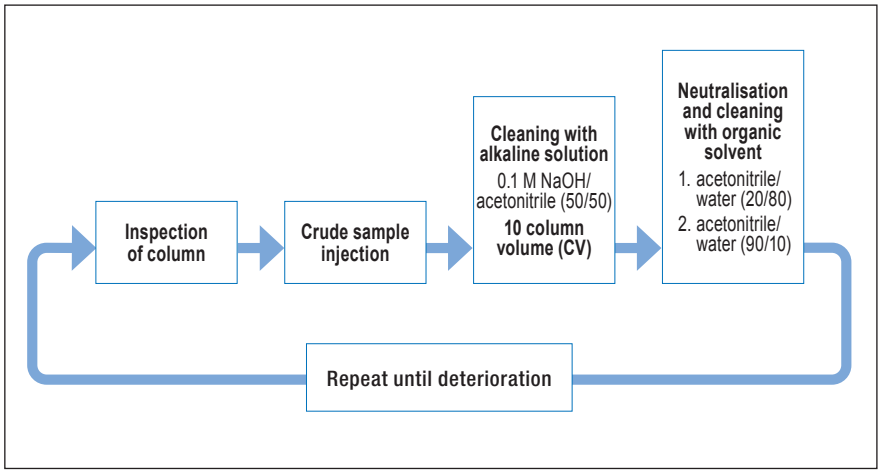
Chemical stability

In contrast to purely silica-based materials the hybrid silica-based YMC-Triart Prep materials can be used at high pH. They are fully compatible with alkaline washing conditions. This in turn reduces production costs still further: lower consumption of packing material and less downtime due to column repacking. An extension of the column lifetime by a factor of more than three has been achieved in CIP studies.









Conclusion

Easy and efficient peptide purification with the most suitable purification solution: YMC-Triart Prep phases deliver the best performance in every aspect.

Selectivity **Loadability** **Stability**

By using the most suitable stationary phase, the cost-efficiency and productivity of purification processes can be optimised. Results driven from real process data clearly show the benefits of using this next generation stationary phase for peptide purifications: **YMC-Triart Prep.**

Contact YMC for your free sample today and discover the qualities of YMC-Triart Prep!