TAG-ASSISTED PEPTIDE SYNTHESIS

Tag-Assisted Peptide Synthesis (TAPS)

Compared to classic solid-phase peptide synthesis (SPPS), the use of TAPS allows for more environmentally friendly chemistry, reduced manufacturing costs, improved sustainability and scalability, while using standard production equipment. Various projects for active pharmaceutical ingredients (APIs) as well as cosmetic peptides have already been initiated and successfully completed with this technology at Bachem.

Applications of Tag-Assisted Peptide Synthesis

TAPS is ideally suitable for the synthesis of peptidic products, such as APIs or API fragments, as well as for ingredients of cosmetic products, since CMR* solvents and reagents can entirely be avoided during the manufacturing process.

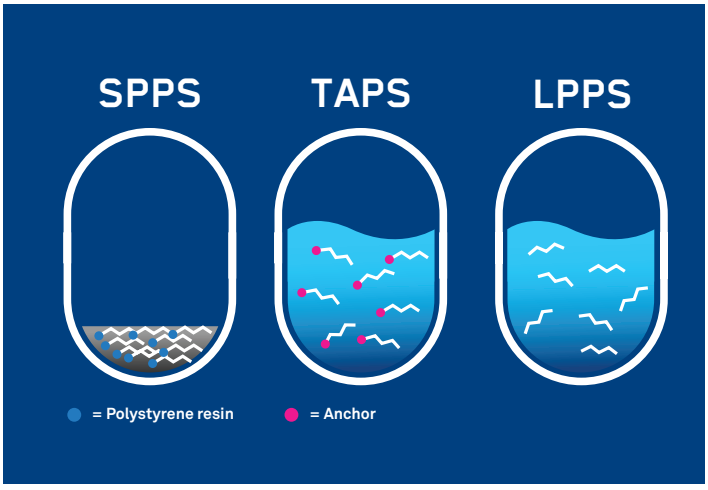
Advantages of Tag-Assisted Peptide Synthesis

- **CMR*-free Processes:** Synthesis without the use of hazardous solvents.
- **Cost Efficient:** Lower equivalents of Fmoc-amino acid derivatives and coupling reagents are required compared to SPPS.
- **"Greener" Processes:** Significant reduction of solvent consumption.
- **Scalable Processes:** Full scalability in inexpensive, generic reactor setups.

*Substances classified as carcinogenic, mutagenic, or toxic for reproduction

Watch our presentation on TAPS.

BACHEM



TAPS

TAPS combines the advantages of SPPS and LPPS processes.

The synthesis of peptides using TAPS is similar to the SPPS processes, but all process steps are carried out entirely in solution. Analogous to SPPS, the peptide assembly proceeds from the C-terminus to the N-terminus. Instead of a solid phase (resin), the peptide is built up on an anchor (tag) that is soluble in organic solvents but insoluble in aqueous solutions. The technology allows the use of the same Fmoc amino acid derivatives as for Fmoc-SPPS. Excess amino acid derivatives and by-products as well as the used reagents can be removed by aqueous extractions.

TAPS combines the advantages of SPPS and LPPS processes

	LPPS	SPPS
Reaction Medium	**Solution**	Gel (swollen insoluble polymer)
Synthesis Strategy	Convergent or stepwise	**Stepwise**
Temporary Protecting Group	Typically Boc or Z	**Typically Fmoc**
Rapidity of Synthesis	Slow	**Fast**
Consumption of Amino Acid Derivatives	**Moderate**	Medium to high
Consumption of Organic Solvents	**Moderate to medium**	High
In-process Control	**Direct monitoring applicable (e.g. HPLC)**	Typically indirect monitoring applied (e.g. resin color tests)
Isolation of Intermediates	Typically isolated by precipitation	**No isolation of intermediates**

■ Advantages of SPPS and LPPS are marked in magenta

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