Peptide Solubility

Peptide solubility is sequence dependent. If experimentally tolerated, the peptide sequence should contain at least 20% charged residues to facilitate solubilization. Meanwhile, A peptide is a kind of bioactive molecules. Improper solubilization can result in loss of the peptide, or even the failure of your experiment.

Most peptides are easy to dissolve in aqueous solutions. However, a common problem encountered is very low solubility or even insolubility of peptides, especially peptides with chains of hydrophobic amino acids. During research, there are at least three fundamental requirements in selecting a solvent to dissolve the peptide prior to use. 1) Selecting the solvent that effectively dissolves the peptide. 2) The solvent has to be compatible with the experimental application. 3) The solvent should not react with or promote degradation of the peptide. When the availability of the sample is not an issue, it is always a good idea to test the solubility of a small portion of the sample before dissolving the entire sample. It is also advisable to choose an initial solvent that can be easily removed by lyophilization in the event that you need to recover the peptide.

The following suggestions may be helpful in solubilizing your peptide.

Num	Peptide	Suggestions
1	Soluble buffer	PH7(*)
2	Soluble temperature	>40℃,home temperature usually
3	Oligopeptide (peptide residues<5）	Soluble in aqueous buffer
4	Hydrophilic peptides charged residues >25%(e.g.Asp, Arg, Lys, His, Glu)	soluble in water or aqueous buffer
5	High(>75%)proportion of Arg,Lys,His,Ser,Tyr,Thr,Asp,Asn,Glu,Gln	Nearly not dissolvable in aqueous buffer.
6	Hydrophobic peptides containing ≥50%	Nearly not dissolvable in aqueous buffer.

Note:

If peptides include cysteine, met or trephine. An oxygen free solution should be used.

For Hydrophobic peptides, 50% (v/v) DMSO / water mixture and subsequently add water / buffer until the desired concentration is achieved.