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Recent progress in green solid-phase peptide synthesis (GSPPS)

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Dimethylformamide (DMF) along with dichloromethane (DCM) has been widely used as solvent in SPPS. However, these chemicals are hazardous and new strategies have been employed to substitute them by green solvents. During the last years, our group has started a program constantly been working in this area of research. Herein we reported the use of 2-Methyltetrahydrofuran (2-MeTHF), cyclopentylmethyl ether (CPME), tetrahydrofuran (THF), N-formylmorpholine, 2-Methyltetrahydrofuran (2-MeTHF), isosorbide dimethyl ether, ethylacetate, α -valerolactone and α,α,α -trifluorotoluene as greener alternative solvents in peptide synthesis as well as Fmoc-removal. The ability of these solvents for swelling of polystyrene and polyethylene glycol resins were evaluated. In addition, racemization and coupling efficiencies were evaluated with a model of peptides, such as Aib-enkephalin pentapeptide and Aib-ACP decapeptide, in combination with polyethylene glycol ChemMatrix resin and polystyrene (PS) resin.

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