Mechanochemical Synthesis

Schedule:

Week 1: Comparison of organic solvents and alternative solvents.

Week 2: Comparison of different types of ball mills and technical parameters.

Week 3: Hydrogenation in a ball mill.

Week 4: Formation of C–C bonds (Heck, Suzuki, Sonogashira, Glaser; Michael, MBH, Knoevenagel, Wittig, Reformatsky; olefin metathesis, etc.).

Week 5: Formation of C–N bonds (imines, oximes, semicarbazones; N-alkylation, etc.).

Week 6: Formation of C–O, C–S, C–X, C–P, C–B, and C–Si bonds; synthesis of heterocycles.

Week 7: Cycloaddition reactions, solvent-free Diels–Alder reactions.

Week 8: Oxidation and reduction reactions using solid reagents.

Week 9: Preparation of amino acids and peptides in a ball mill.

Week 10: Polymer synthesis under solvent-free conditions.

Week 11: Solvent-free asymmetric organocatalysis.

Week 12: Preparation of transition metal complexes in a ball mill.

Week 13: Applications in materials chemistry: nanostructures, MOFs.