EFFECT OF POLYMERIZATION COMPONENTS ON OXYGEN-TOLERANT PHOTO-ATRP

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Photo-ATRP has recently emerged as a powerful technique that allows for oxygen-tolerant polymerizations and the preparation of polymers with controllable dispersity and high end-group fidelity. [1] However, the effect of various photo-ATRP components on oxygen consumption and polymerization remains elusive. Herein, we employ an in situ oxygen probe and UV–Vis spectroscopy to elucidate the effects of ligand, initiator, monomer, and solvent on oxygen consumption. We found that the choice of photo-ATRP components significantly impacts the rate at which the oxygen is consumed and can subsequently affect both the polymerization time and the dispersity of the resulting polymer. Importantly, we discovered that using the inexpensive ligand TREN results in the fastest oxygen consumption and shortest polymerization time, even though no appreciable reduction of CuBr2 is observed. This work provides insight into oxygen consumption in photo-ATRP and serves as a guideline to the judicious selection of photo-ATRP components for the preparation of well-defined polymers. [2]

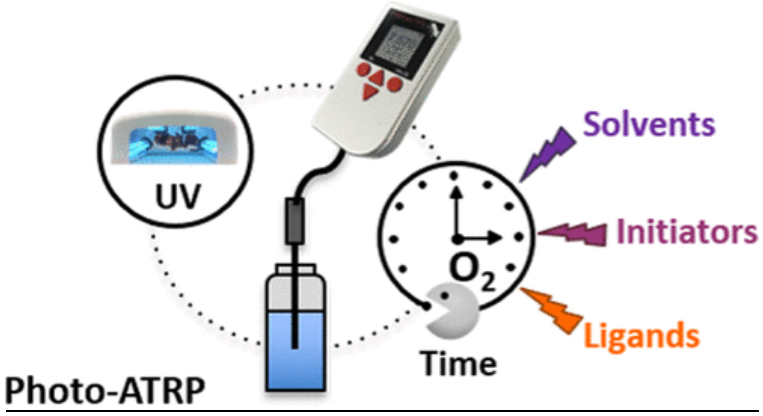

Figure 1: Effect of Polymerization Components on Oxygen-Tolerant Photo-ATRP

[1] Parkatzidis at all., Chem, **2020**, 6, 1575-1588.

[2] Rolland at all., ACS Macro Lett., **2019**, 8, 1546−1551.