Azide–Alkyne Cycloaddition with a Melanin-Supported Copper(I) Catalyst

Significance: A copper(I) catalyst supported on poly(ethylene glycol) (PEG) grafted melanin granules [Cu(I)/M-dots], prepared by the method shown in eq. 1, catalyzed an azide–alkyne cycloaddition in phosphate-buffered saline at room temperature during 30 minutes to give the corresponding triazoles in ≤95% yield (eq. 2).

Comment: In the azide–alkyne cycloaddition of amino-PEG₃ azide with ethynylbenzene, the Cu(I)/M-dots catalyst was recovered by centrifugation and reused six times without significant loss of its catalytic activity. The Cu(I)/M-dots-catalyzed azide–alkyne cycloaddition was also used in bioconjugation and cell labeling.