

Abstract: An overwhelming majority of synthetic rubbers are not amenable to modern recycling methods; therefore, they sit in landfills and pollute the environment. Out of all the globally produced rubbers in the world, the tire industry is the largest market segment. Billions of tires currently, which use the polymer polybutadiene as a major component, sit in landfills due to the lack of economic incentives to recycle them. Polymer upcycling, which uses polymer waste to create new products of higher value, provides a promising incentive to recycle these discarded tires and give them new purposes. However, limited research has been done in the field of polymer upcycling with polybutadiene. Herein, we show the functionalization of polybutadiene with catecholic moieties to afford a strong adhesive polymer. The synthesis makes use of the cheap and readily available compound eugenol, as well as photoinitiated thiol-ene coupling reactions. Our findings show the potential that polybutadiene holds for polymer upcycling. We anticipate our study to be a starting point in providing new incentives to recycle polybutadiene and reduce the amount of synthetic rubbers that are improperly discarded.