日本化学会 第105春季年会 (2025)

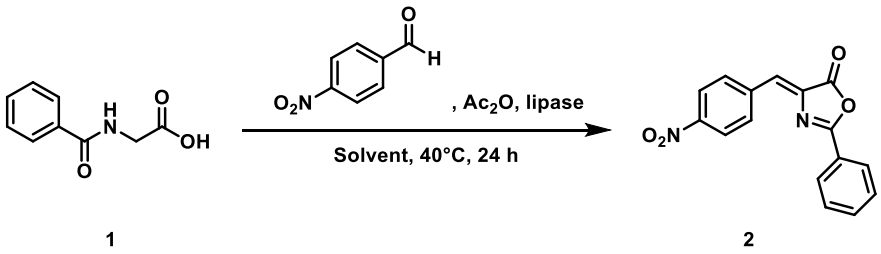
Synthesis of Azlactones Using Lipases in Deep Eutectic Solvents

([1]*Osaka Prefecture University*, [2]*Osaka Metropolitan University*) ○Hiroki Onishi,[1] Remi Nishimura,[1] Hideo Kojima[2]

Keywords: Lipase; Azlactones; Deep Eutectic Solvents

As alternatives to organic solvents, deep eutectic solvents (DESs) have been acknowledged as green solvents. Deep eutectic solvents are prepared by mixing a hydrogen bond acceptor (HBA) and a hydrogen bond donor (HBD) in certain proportions and heating. These solvents are green due to their low volatility, non-flammability, non- or low toxicity, biodegradability, and chemical stability. Several examples of lipase-catalyzed organic reactions in DESs have been reported, however, no studies have been reported on the lipase-catalyzed synthesis of azlactones. Azlactones have been utilized as precursors for pharmaceuticals and agrochemicals. This research investigated the lipase-catalyzed synthesis of azlactones in choline chloride-based DESs (Scheme 1). In this presentation, we will provide details of the experiments.

The reaction of hippuric acid (**1**) (0.25mmol) with acetic anhydride (2.5mmol) and *p*-nitrobenzaldehyde (0.25mmol) in the presence of porcine pancreatic lipase (PPL) (134mg) in DESs (HBA: ethylene glycol, glycerol) at 40 ℃ for 24 h was carried out (Scheme 1). The formation of azlactone **2** was confirmed by its ^{1}H NMR spectra (Table 1). In both DESs, the yield of **2** was higher with the addition of PPL than without.



1 2

Scheme 1

Table 1. The yield of **2**.

Lipase	ChCl:ethylene glycol (1:2)	ChCl:glycerol (1:2)
None	4%	4%
PPL	18%	26%