

An amperometric biosensor based on Co-hemin Metal-Organic frameworks for lactose detection of dairy product

최한석, 김형렬, 김은정, 김경래, 유하영¹, 이자현², 박철환³, 김승욱[†]

고려대학교; ¹상명대학교; ²동양미래대학교; ³광운대학교

(kimsw@korea.ac.kr[†])

Metal-organic frameworks (MOFs) formed by metal ions and organic linkers through strong coordination bonds. MOF has unique physical and chemical properties including large specific surface area, high porosity, numerous many active sites and post-synthesis modification. MOFs have been extensively applied in several areas, such as catalysis, energy, gas storage and drug delivery. Recently, MOFs have been interested in application of electrochemical biosensors. Because it provides large specific surface area to load enzymes, the performance of enzyme activity and stability could be improved. In this study, a MOF was synthesized by cobalt and hemin to develop an electrode for efficient detection of lactose containing in dairy products. The cellobiose dehydrogenase from *Phanerochate chrysosporium* (PcCDH) was immobilized on the Co-hemin MOF/chitosan modified electrode to establish a lactose biosensor. The lactose based biosensor showed an excellent performance with broad linear range and good selectivity. This demonstration indicated the feasibility of Co-hemin MOFs/chitosan based biosensor using PcCDH for detection of lactose containing in dairy products.