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Flexible biosensor has received much attention in field of wearable biosensor and point of care diagnosis. In addition, introduction of flexibility to the biosensors have been researched due to the saving space of device, application to various environment. Also, detection of glucose is an important because high concentration of glucose can cause diabetes mellitus, which causes death and disability in humans. From these points of view, the electrochemical flexible biosensor composed of glucose oxidase (GOx), gold (Au) and molybdenum disulfide (MoS₂) is developed to detect glucose. Electrochemical flexible biosensors were fabricated by sputter deposition of Au, spin coating of MoS₂ and sputter deposition of Au (Au@MoS₂@Au) on PI substrate. The GOx is immobilized on the surface of Au@MoS₂@Au through specific binding with chemical linker immobilized on the Au@MoS₂@Au for glucose detection. The fabricated flexible biosensor were indicated more highly electrochemical properties compared to biosensor without MoS₂. This fabricated can be used to develop the flexible bioelectronics device with high electrochemical signal for portable device platform.