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High-performance Flexible Photodetectors based on Aligned Cadmium Sulfide Nanowire Networks DONG-GUK CHO, Department of Physics and Astronomy, Seoul National University, KWANG HEO, HYUNGWOO LEE, YONGJU PARK, JINHO PARK, Seoul National University, HYUN-JIN LIM, DUHEE YOON, Sogang University, CHANGHEE LEE, MIYOUNG KIM, Seoul National University, HYEONSIK CHEONG, Sogang University, JONGHYURK PARK, Electronics and Telecommunications Research Institute, JIKANG JIAN, Xinjiang University, SEUNGHUN HONG, Seoul National University — We developed a method to mass-produce aligned cadmium sulfide (CdS) nanowire (NW) network channels for highly flexible and high-performance photodetectors. In this method, CdS NWs were aligned along the molecular patterns on flexible substrates by a directed assembly strategy. The aligned CdS NW patterns were utilized as the channel of flexible photodetectors. The photodetectors based on *aligned* CdS NWs showed ~ 10 times higher photosensitivity and ~ 100 times faster photoresponse than those based on *randomly-oriented* CdS NW networks. Additionally, the stable photoconductive characteristics of our flexible photodetectors were maintained even when the photodetectors were bent down to a 0.2 mm radius of curvature. This simple but efficient strategy should pave the way for the large-scale fabrication of low-cost and high-performance flexible photodetectors based on the aligned CdS NW networks.

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