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| **Abstract:** |  |
| During fabrication of anodic aluminum oxide (AAO) membranes, it is observed that sometimes their nanochannels experience bending and branching. In this research the bending and branching behavior of AAO nanochannels was studied. AAO nanochannels were fabricated in 99.56% pure aluminum (Al) in which Si and Fe impurities blocked the propagation of some nanochannels. It was observed that the neighboring channels bend and make branches for anodizing the Al beneath impurities. The authors developed a model that explains the bending and branching of AAO nanochannels. Our experiments show that AAO nanochannel can bend and divide into branches if it experiences nonanodized Al on one side of the nanochannel. Bending and branching effects were also observed when AAO was fabricated using Al with nonplanar surfaces. The authors found that the bending and branching behavior of AAO nanochannels minimizes impurity defects in the AAO membrane. Based on experimental results, a model has been developed for making 3D structure using AAO nanochannels. | |