CLAIMS

What is claimed is:

1. A method for fabricating a single nanopore in a membrane, comprising:

selecting an electric potential that induces an electric field that approaches dielectric strength in the membrane, where the electric field has a value greater than 0.1 volt per nanometer;

applying the electric potential across a membrane comprised of a dielectric material~~;~~, where the membrane is disposed in a fluid with ions;

monitoring leakage current across the membrane while the electric potential is being applied across the membrane;

detecting an abrupt increase in the leakage current across the membrane while the electric potential is being applied across the membrane; and

removing the electric potential across the membrane in response to detecting the abrupt increase in the leakage current to stop the pore fabrication.

2. The method of claim 1 wherein selecting the electric potential further comprises selecting the electric potential that approaches dielectric strength of the membrane material.

3. The method of claim 1 wherein detecting an abrupt increase in the leakage current further comprises determining a rate of change of the monitored current and comparing the rate of change to a threshold.

4. The method of claim 3 wherein removing the electric potential across the membrane further comprises removing the electric potential when the rate of change of the monitored current exceeds the threshold, thereby stopping the fabrication.