**Table S1.** Data applied to calculate the irradiation dose per molecule. \* marks values from CASINO simulations, $ marks derived values.

|  |  |
| --- | --- |
| initial kinetic energy of the electrons, Einit | 5 keV |
| irradiation current, I | 100 ± 2 nA |
| total number of electrons | (2.3 ± 0.3)×1015 |
| average kinetic energy of backscattered electrons, Ebs\* | 2.9 ± 1.0 keV |
| fraction of backscattered electrons, fbs\* | 0.10 ± 0.01 |
| average kinetic energy of transmitted electrons, Etrans\*, | 0 keV |
| fraction of transmitted electrons, ftrans\* | 0 |
| average penetration depth, l\* | 235 ± 29 nm |
| density of the ice, ρ | 1.98 ± 0.03 g cm-3 |
| irradiated area, A | 3.2 ± 0.1 cm2 |
| total # molecules processed$ | (2.7 ± 0.1)×1017 |
| dose per molecule, D$ | 39 ± 2 eV |