Waves with frequencies in the vicinity of the oxygen cyclotron frequency and its harmonics have been regularly observed on the Van Allen Probes satellites during geomagnetic storms. We focus on properties of these waves and present events from the main phase of two storms on November 1, 2012 and March 17, 2013 and associated dropouts of ~a few MeV electron fluxes. They are electromagnetic, in the frequency range ~0.5 – several Hz, and amplitude ~0.1- a few nT in magnetic and ~0.1- a few mV/m in electric field, with both the wave velocity and the Poynting vector directed almost parallel to the background magnetic field. These properties are very similar to those of electromagnetic ion cyclotron (EMIC) waves, which are believed to contribute to loss of ring current ions and radiation belt electrons and therefore can be also important for inner magnetosphere dynamics.