



From sedimentary basins to volcanic passive margins: a tectonic and thermal comparison between the Disko-Svartenhuk and Vøring passive margins

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Lithosphere extension and consecutive break-up above a melting mantle lead to the formation of volcanic passive margins. All volcanic margins developed in continental area submitted to long-term extension leading to the formation of a sedimentary basin. We compare the tectonic and thermal evolution of the W-Greenland volcanic margin (by presenting new data) to published data from the Vøring margin in Norway. Both volcanic margins developed during the Eocene, within the widespread North Atlantic Volcanic Province. They both developed after a period of transient non-magmatic lithosphere stretching/thinning that began as soon as the Palaeozoic for the Vøring margin and during the Early Cretaceous for the W-Greenland margin. Consecutively, both margins have different widths, the W-Greenland being significantly narrower. We present data suggesting that the thermal evolution of the two margins is quite different at the time of breakup. The thermal gradient that we measured in the West Greenland margin is higher than at Vøring, in apparent good concordance with the lava chemistry in the Disko-Svartenhuk area. In both margins, the Late-Cretaceous tectonics of the sedimentary basin seems to be accommodated by detachment faults dipping oceanward, whereas syn-magmatic extension is accommodated by arrays of continentward dipping detachment faults (bounding the so-called SDRs) localized close to the continent-ocean transition area. We discuss both the analogies and differences between the two margins, drawing an integrated model of volcanic margin development from the sedimentary stage.