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Magnetic anomalies have been observed over oil fields from aeromagnetic surveys. These anomalies have been linked with the presence of hydrocarbons and that has generated a lot of interest over possible application of magnetism in the exploration of oil and gas but there has also been debate over the origin of the magnetic minerals causing the magnetic anomaly. Our approach was to generate crude oil in the lab using three source rocks from the Wessex Basin, England, which is a hydrocarbon province. The source rocks were the Kimmeridge Clay, Oxford Clay and the Blue Lias. The source rocks were powered and pyrolysed in a high pressure vessel. The crude oil was then extracted and the magnetic signal of the remaining pyrolysate measured. We discovered a significant contrast in the magnetic hysteresis and thermomagnetic properties between the pyrolysate and the unpyrolysed (immature) source rocks. We will present the preliminary results, which indicate that magnetic minerals were generated as a result of heat and therefore related linked to maturation of the source rocks