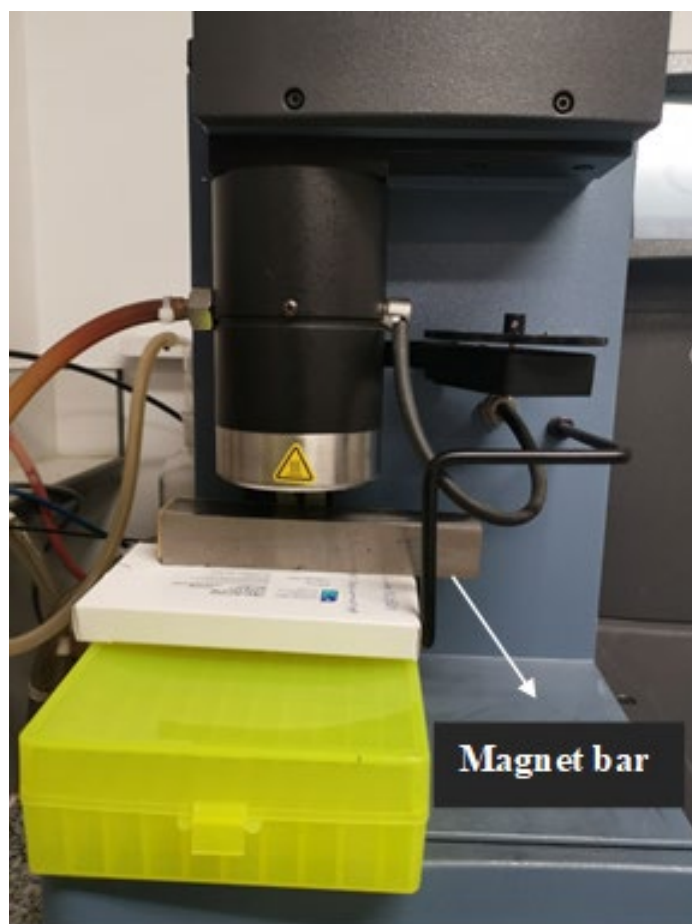


## **Supplementary material: The TGA temperature calibration using Curie temperature standard of Nickel.**

The calibration was performed following the manufacturer's instruction for the method of Curie temperature of Nickel; the Nickel has a Curie temperature, which is the temperature at which the metal undergo a sharp change in its magnetic properties, this can be detected in the TGA, and the result can be compared to the literature Curie value to calibrate the instrument. The summary of the calibration steps as follow:

A piece of the Curie temperature standard approximately 2 mg was placed into a clean and tared platinum TGA pan. The furnace was raised than a bar magnet was carefully placed below the furnace, adjusted at a height directly underneath (see figure 1) until a mass loss of approximately 2 % was detected. Once the magnets height was fixed, the Curie sample was heated using a rate identical to the experiments used in the study (10 °C/min), purge gas settings were also identical to those used in the study continued until an "S" shaped weight loss versus temperature curve was observed. The TG analysis software was used to determine the extrapolated endpoint of this "S" shaped curve (figure 2). With the Curie temperature given as marked on figure 2.



*Figure 1 The setting of magnet bar down onto the furnace of the TGA that been used in the temperature calibration of the instrument.*

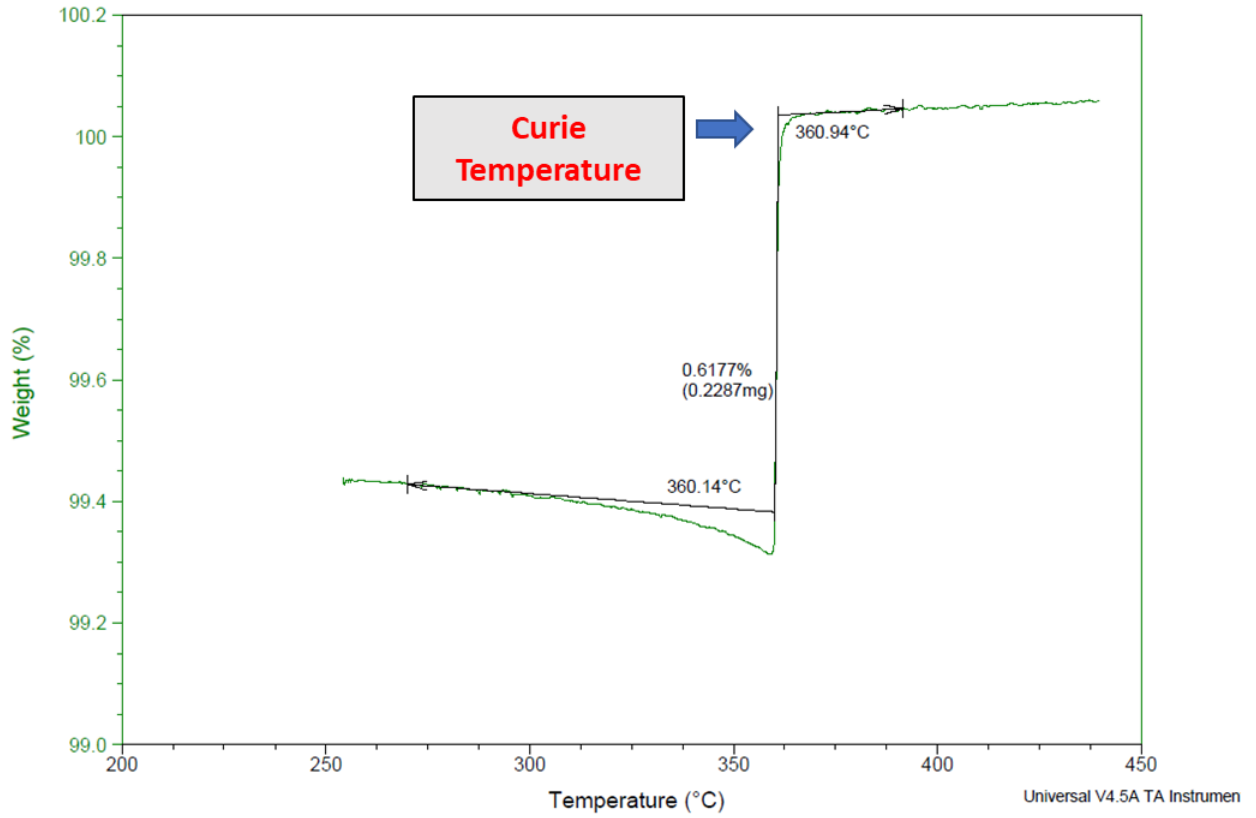


Figure 2 The Curie temperature calibration of the Nickel determined using the TA Universal Software analysis. The determined Curie temperature of the Nickle was  $360.9 \pm 0.1$  °C.