XPS analysis data was adjusted for charge bias using the standard C1s 284.5 eV binding energy.

Results and discussion

The results of the study of the process of processing polymer waste showed that the nature of the catalysts affected the yield of liquid products and the optimal catalyst was 1Mo1W@Taizhuzgen; and the yield of liquid products in the thermocatalytic processing of waste polymers with heavy oil residue was high.

According to the TGA results the thermal decomposition of catalysts does not affect the processing of polymer waste, since the process takes place at a temperature of 800ºC. The results of samples of TGA composite catalysts are shown in Figure 1.

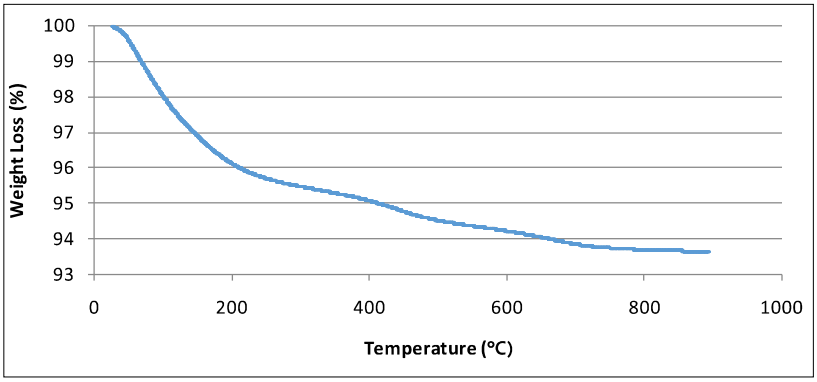

Figure 1 – TGA samples of a composite catalyst based on natural zeolite of Taizhuzgen: 1Mo1W@Taizhuzgen

The XRD pattern of the composite catalysts is shown in Figure 2. The study of the effect of the introduction of various transition metals-active components of catalysts on the heat resistance of zeolites was carried out at the next stage [14]. Figure 2 shows X-ray spectra of the Taizhuzgen zeolite and the composite catalyst 1Mo1W@Taizhuzgen, as well as catalysts based on them after heating in air at 500 °C for 1 hour. It was found that the introduction of transition metals contributes to the modification of the crystal structure of aluminosilicates, especially after high-temperature calcination [15]. The introduction of cations of group VIII elements of molybdenum and tungsten contributes to the preservation of the zeolite framework (Figure 2). It was found that the amount of MoO_3 and WO_3 oxides varies depending on the method and supporting procedure.

Thus, X-ray data indicate that significant changes in the structure of the catalyst, leading to the formation of amorphous aluminosilicate. All the regularities are valid both for natural zeolites and for 1Mo1W@Taizhuzgen.

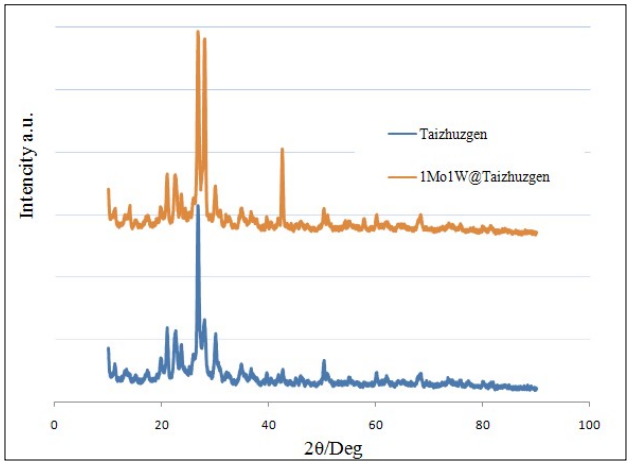

Figure 2 – XRD pattern of the catalyst 1Mo1W@Taizhuzgen