Oxide Dispersion Strengthened (ODS) steel is one of advanced materials used in elevated temperature because of the stable structure. Ferritic ODS is as Fe-based ODS steel. ODS steel is synthesized by mechanical alloying.

This research aims to know the influence of milling time as well as the optimal milling on the synthesis of both ODS ferritic structure alloy steel which has a composition similar to ODS steel commercial MA 957 and utilizes local iron sand.

The result shows that the more milling time used the more crystalline size decreases, but overtime milling makes amorphization. Powders morphology shows on both pellet of MA 957 and MA 957 iron sand agglomerated at 100 hours milling. Fe-Cr phase forms in MA 957 after sintering, but MA 957 iron sand forms Fe and MnCr$_2$O$_4$ phases. EDS shows homogeneity only occurs on 100 hours milled MA 957, whilst in MA 957 iron sand none. Hardness test shows the more milling time, the highest hardness increases on MA 957. On MA 957 iron sand, the more milling time the more hardness decreases, this is due to the initial elemental of iron sand. Both on MA 957 and MA 957 iron sand forms porosities in which on MA 957 iron sand forms more.

Keywords: steel, ferritic, ODS, mechanical alloying, iron sand, MA957
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