Conclusions

(1) In the as-quenched condition, the microstructure of the $Cu_{2.9}Mn_{0.1}Al$ alloy was of $D0_3$ phase containing plate-like γ_1' martensite with internal twin. This is similar to that reported by other workers in the Cu_3Al alloy.

(2) With increasing manganese content to above 5 at.% ($X \geqq 0.2$), no evidence of the γ_1' martensite could be detected and the $D0_3$ matrix would be changed to ($D0_3 + L2_1$) phases with a modulation structure. It means that the Ms temperature was decreased with increasing the manganese content.

(3) The as-quenched microstructures of the $Cu_{2.8}Mn_{0.2}Al$ or $Cu_{2.7}Mn_{0.3}Al$ alloys was of $D0_3$ phase containing extremely fine L-J precipitates, where the $D0_3$ phase was formed through the $\beta \rightarrow B2 \rightarrow D0_3$ transition during quenching.

(4) The as-quenched microstructure of the $Cu_{2.6}Mn_{0.4}Al$ was a mixture of ($D0_3$+$L2_1$+L-J) phases with modulation structure,

where the ($D0_3$+$L2_1$) phases were formed through the $\beta \rightarrow$ $B2 \rightarrow D0_3 + L2_1$ transition during quenching.

(5) No evidence of the a/4<111> APBs could be determined in the alloy D. However, the a/4<111> APBs were clearly observed in the both alloy B and alloy C. This result seems to suggest that the increase of the manganese content in the Cu-Mn-Al alloys could increase the B2 domain size.

(6) The size of the $D0_3$ domains increased with increasing the manganese content. It also means that an increase of manganese content would increase the $B2 \rightarrow D0_3$ ordering transition temperature.

(7) The amounts of the L-J particles were increased with increasing the manganese content.