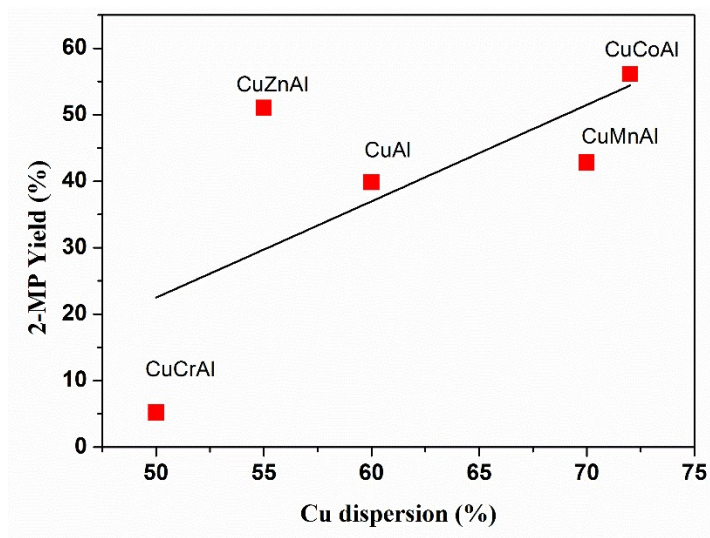


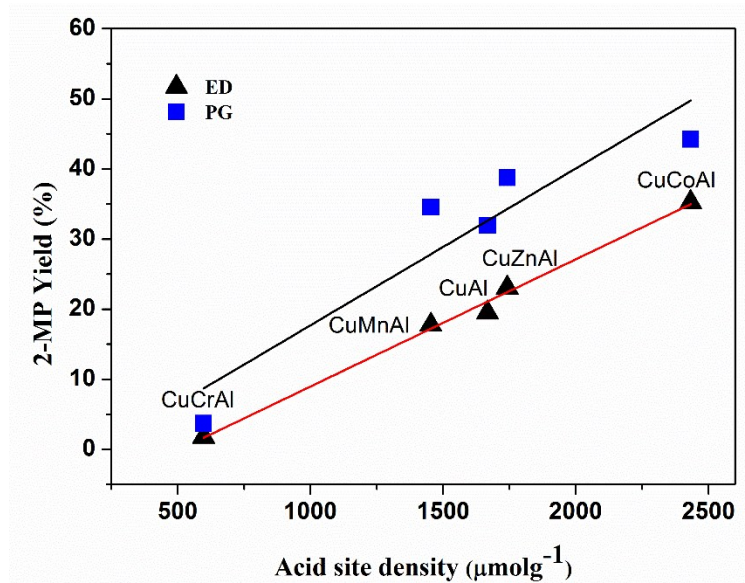
## Supporting information

Table S1 Elemental analysis of Cu, M and Al by SEM-EDS.

| Sample | Theoretical value (%) |       |        | Actual value (%) |       |        |
|--------|-----------------------|-------|--------|------------------|-------|--------|
|        | Cu (%)                | M (%) | Al (%) | Cu (%)           | M (%) | Al (%) |
| CuAl   | 35                    | --    | 30     | 43.4             | --    | 24.5   |
| CuCoAl | 18                    | 18    | 30     | 19.7             | 20.8  | 25.0   |
| CuCrAl | 18                    | 18    | 30     | 34.5             | 20.9  | 23.3   |
| CuMnAl | 18                    | 18    | 30     | 20.2             | 19.1  | 25.0   |
| CuZnAl | 18                    | 18    | 30     | 24.1             | 18.7  | 27.6   |



**Supplementary Figure 1a.** 2-MP yield as a function of the Cu particle size for the reduced CuMAI catalysts. (Reaction conditions: 0.5 g of catalysts, temperature = 400 °C)



**Supplementary Figure1b.** Acidic site density versus 2-MIP yield for the CuMAI catalysts.

(Reaction conditions: 0.5 g of catalysts, temperature = 360 °C)