**Table 1.** Mole ratio of precursors for preparing Mg(1-x)Ni(x)O and Mg(1-x)Mn(x)O powders

|  |  |  |
| --- | --- | --- |
| **Species** | **MgCl2 (mol %)** | **NiCl2 or MnCl2 (mol %)** |
| 1 | 100 | 0 |
| 2 | 90 | 10 |
| 3 | 80 | 20 |
| 4 | 70 | 30 |
| 5 | 60 | 40 |
| 6 | 50 | 50 |
| 7 | 0 | 100 |

**Table 2.** Average crystallite size of Mg1-xMxO powders according to the content of M (M = Ni, Mn) and heat treatment temperature

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample** | **Temperature** | **2ϴ°** | **hkl** | **FWHM (rad)** | **Crystallite size (nm)** |
| **Ar (100%)****atmosphere** | **MgO** | 600℃ | 42.79 | 111 | 0.59 | 42.79 |
| 800℃ | 42.90 | 111 | 0.18 | 42.90 |
| 1000℃ | 42.88 | 111 | 0.18 | 42.88 |
| **Mg0.7Ni0.3O** | 600℃ | 43.01 | 111 | 0.14 | 43.01 |
| 800℃ | 42.94 | 111 | 0.12 | 42.94 |
| 1000℃ | 43.09 | 111 | 0.24 | 43.07 |
| **NiO** | 600℃ | 43.34 | 111 | 0.24 | 43.34 |
| 800℃ | 43.26 | 111 | 0.18 | 43.26 |
| 1000℃ | 43.28 | 111 | 0.16 | 42.92 |
| **Ar(95%)+H2(5%)****atmosphere** | **MgO** | 600℃ | 42.89 | 111 | 0.43 | 19.51 |
| 800℃ | 42.92 | 111 | 0.39 | 21.46 |
| 1000℃ | 42.90 | 111 | 0.14 | 61.32 |
| **Mg0.7Mn0.3O** | 600℃ | 42.36 | 111 | 0.71 | 11.89 |
| 800℃ | 42.33 | 111 | 0.47 | 17.85 |
| 1000℃ | 42.17 | 111 | 0.39 | 21.40 |
| **MnO** | 600℃ | 40.61 | 111 | 0.18 | 47.34 |
| 800℃ | 40.58 | 111 | 0.18 | 47.33 |
| 1000℃ | 40.58 | 111 | 0.14 | 60.84 |