**Supplemental material**

**Preparation of N-acetyl-para-aminophenol via a flow route of a clean amination and acylation of p-nitrophenol catalyzing by core-shell Cu2O@CeO2**

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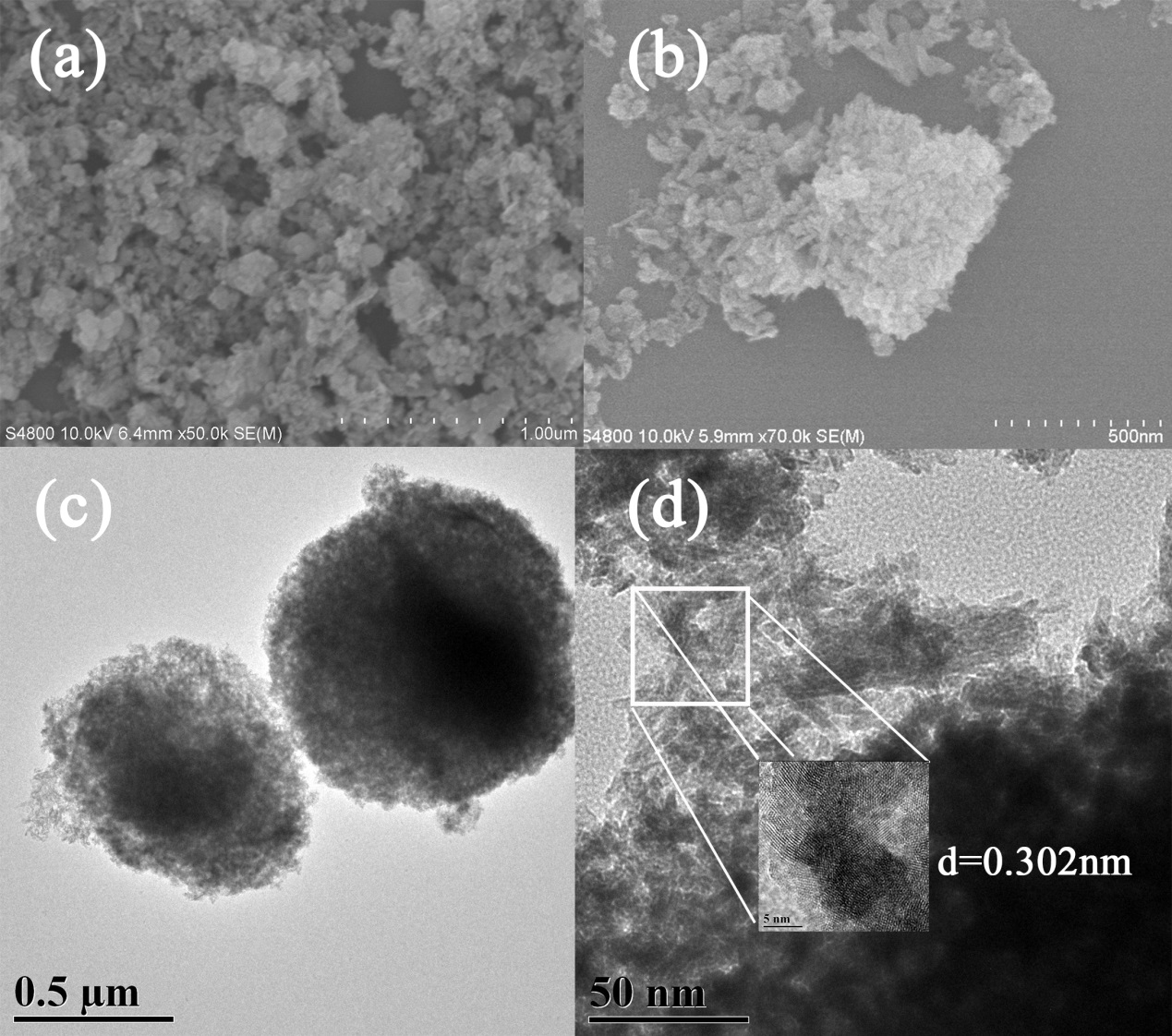


Fig.S1 SEM images of CeO2 (a,b)

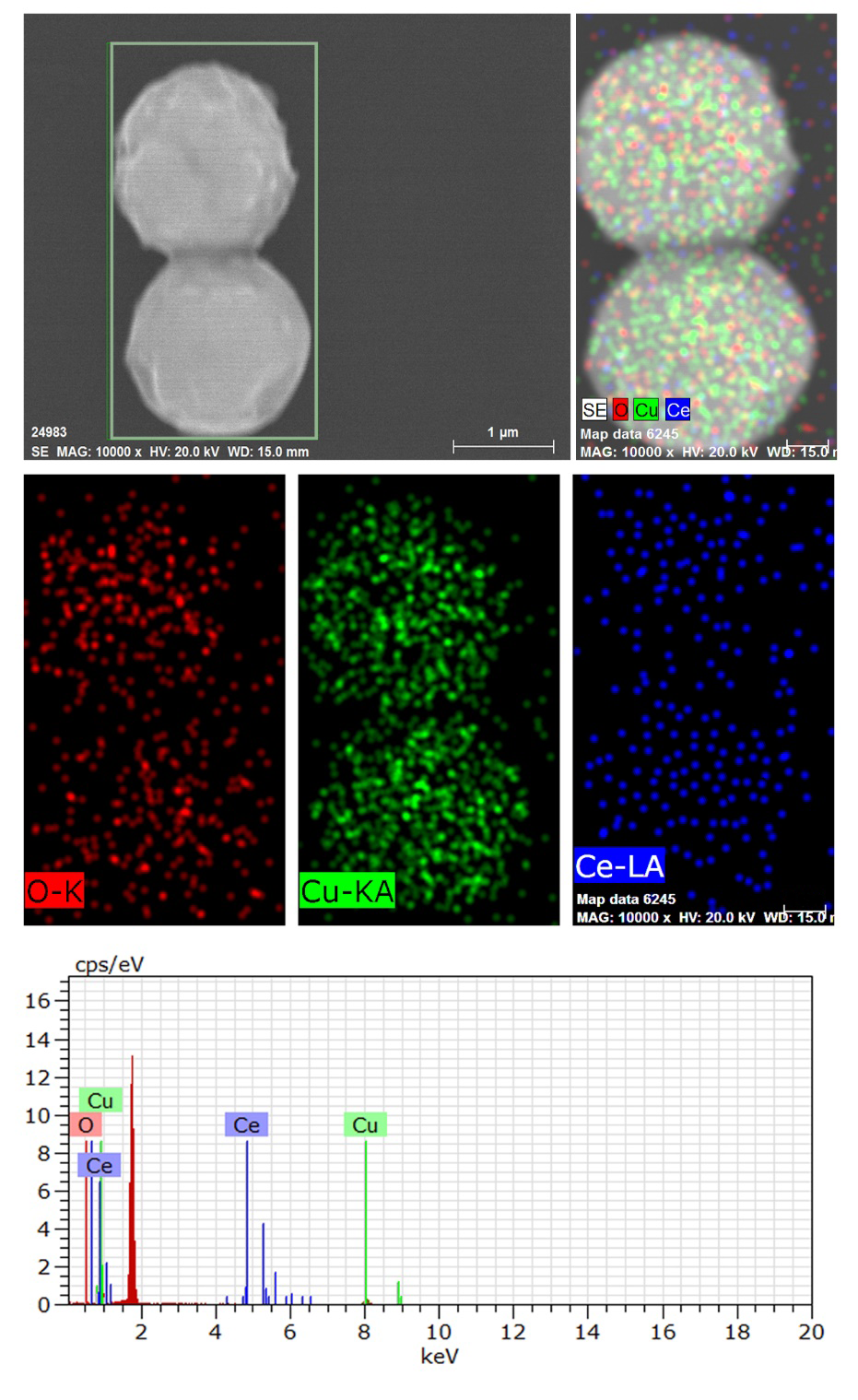


Fig.S2 EDX images of 3Cu2O@CeO2

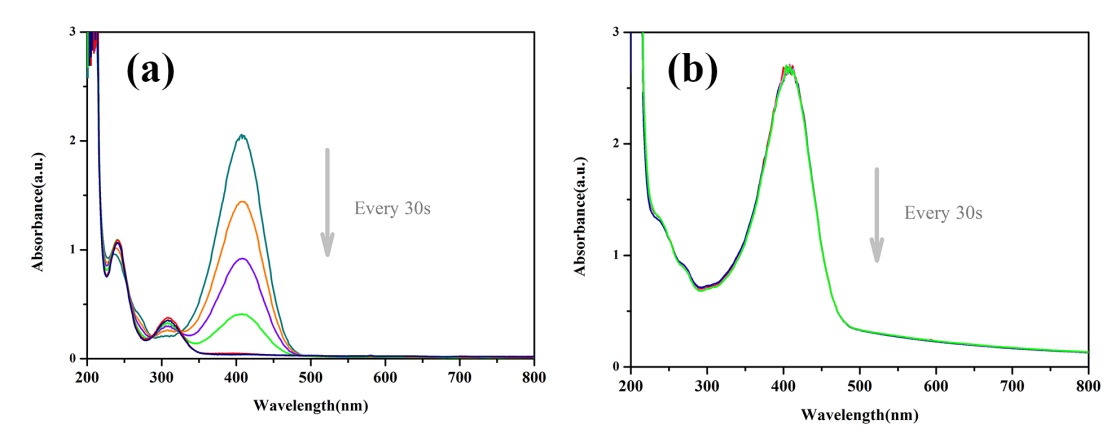


Fig.S3 Reduction of p-NP over (a) the as-prepared Cu2O and (b) the as-prepared CeO2.

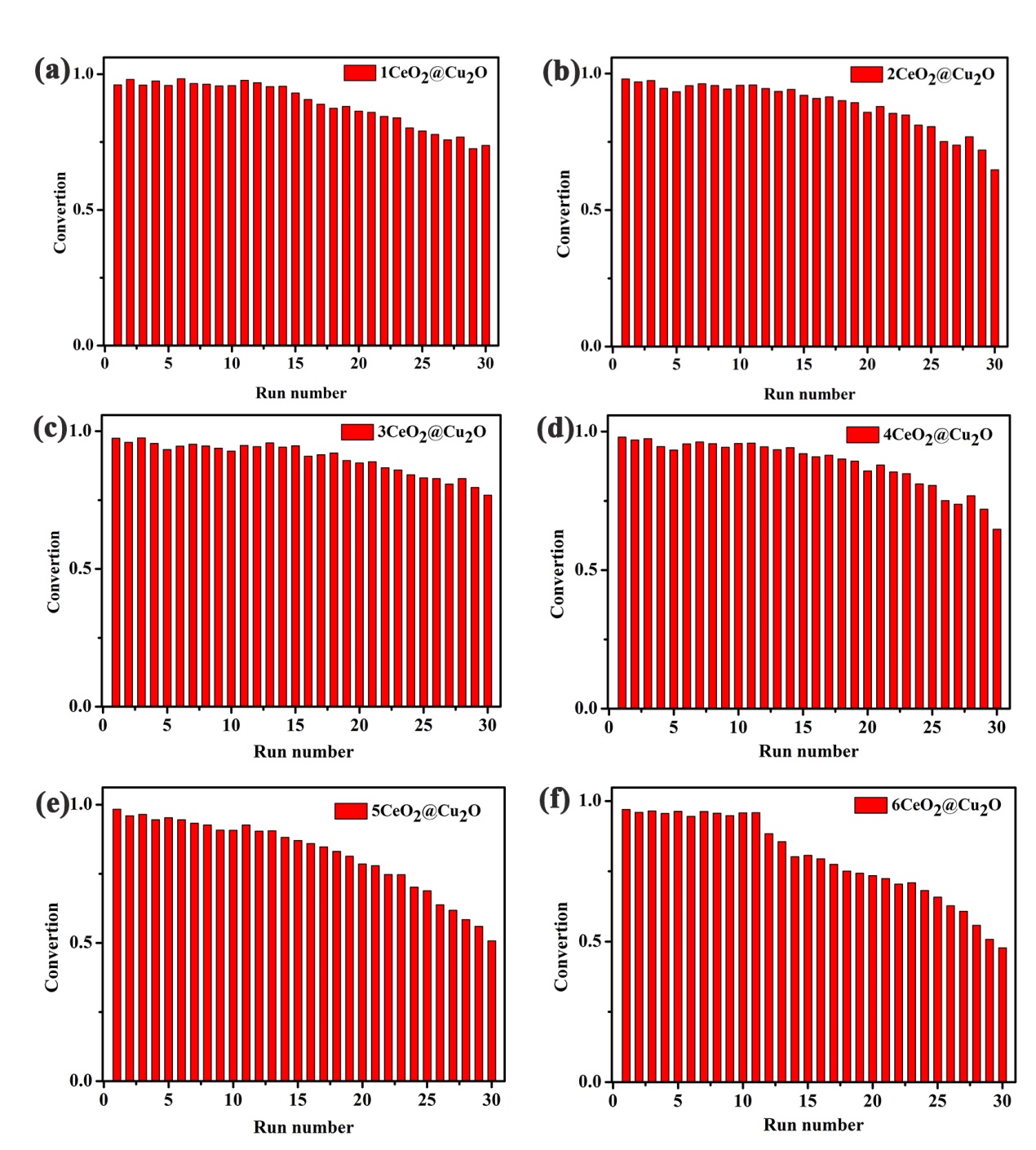


Fig.S4 Recycle performance of p-NP conversion with the as-prepared CeO2@Cu2O

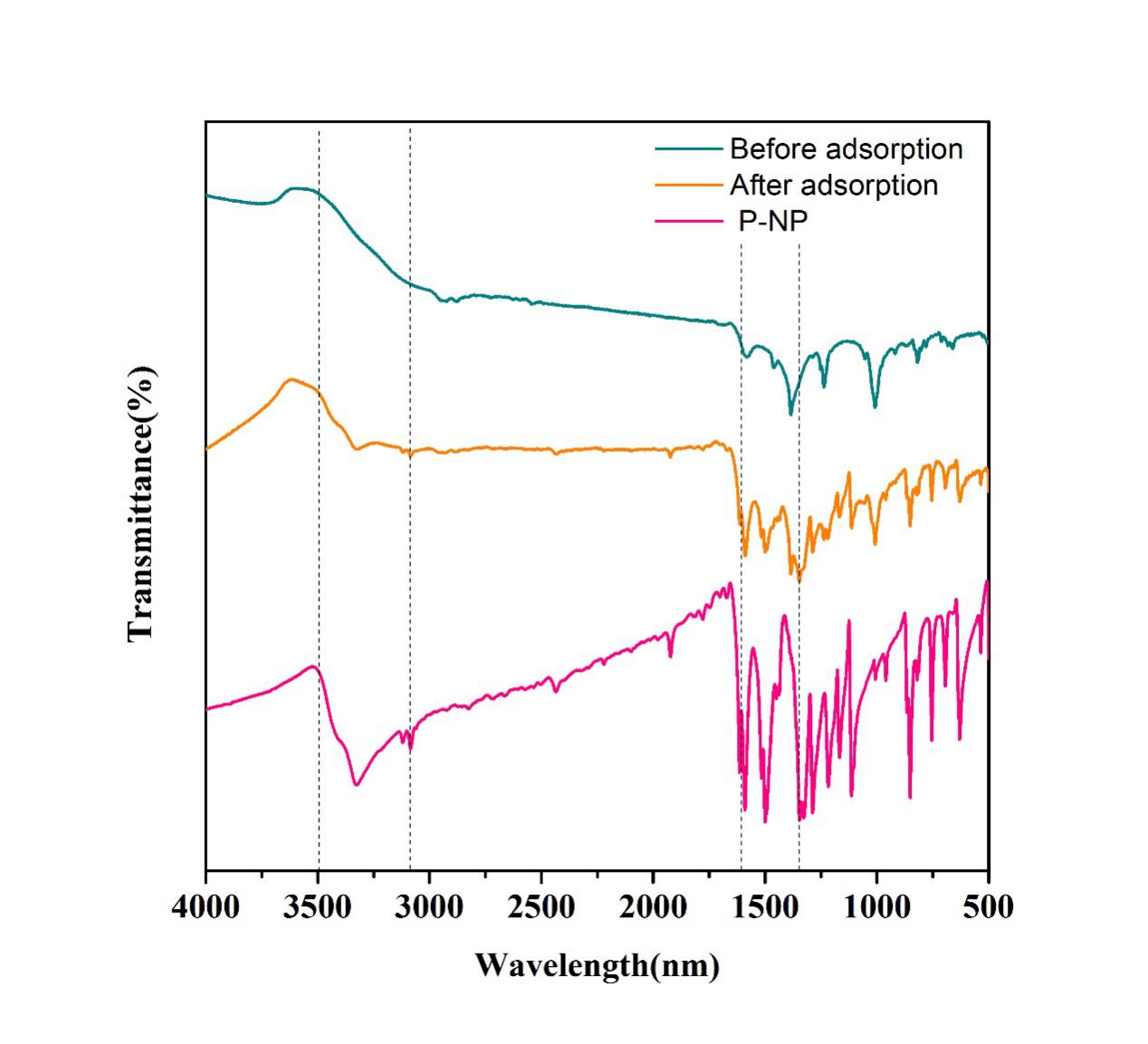


Fig. S5 The IR spectra of 3CeO2@Cu2O before and after adsorption of p-NP.

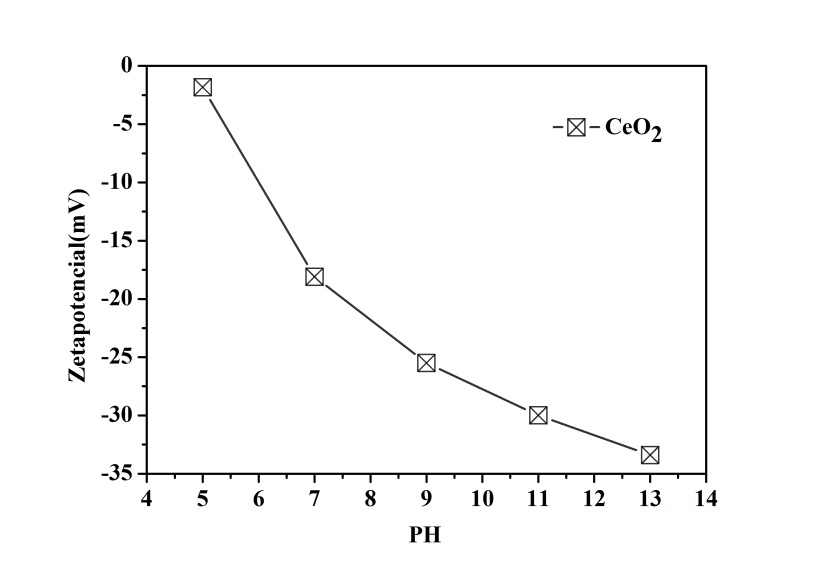


Fig.S6 The Zeta-potential of CeO2.

Table S1 The reaction rate constants k for the reaction of p-NP over the prepared catalysts

|  |  |
| --- | --- |
| As-prepared catalyst | The activity factor k(s-1 mg-1) |
| Cu2O | 0.0083 |
| 1CeO2@Cu2O | 0.01285 |
| 2CeO2@Cu2O | 0.01982 |
| 3CeO2@Cu2O | 0.02529 |
| 4CeO2@Cu2O | 0.02954 |
| 5CeO2@Cu2O | 0.03229 |
| 6CeO2@Cu2O | 0.0328 |

Table S2 Cerium element associated characteristic peak positions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Binding energy of Ce 3d 5/2, 3/2 in Cu2O@CeO2 (after reaction) | | | | Binding energy of Ce 3d 5/2, 3/2 in Cu2O@CeO2 (before reaction) | | | |
| peak | Valence state | binding energy (eV) |  | peak | Valence state | binding energy (eV) |  |
| α1 | +3 | 881.7 |  | α1 | +3 | 881.7 |  |
| α2 | +4 | 882.6 |  | α2 | +4 | 882.6 |  |
| α3 | +3 | 885.2 |  | α3 | +3 | 885.2 |  |
| α4 | +4 | 888.3 |  | α4 | +4 | 888.3 |  |
| α0 | +4 | 897.9 |  | α0 | +4 | 897.9 |  |
| β1 | +3 | 899.2 |  | β1 | +3 | 899.2 |  |
| β2 | +4 | 901.0 |  | β2 | +4 | 901.0 |  |
| β3 | +3 | 903.3 |  | β3 | +3 | 903.3 |  |
| β4 | +4 | 907.2 |  | β4 | +4 | 907.2 |  |
| β0 | +4 | 916.7 |  | β0 | +4 | 916.7 |  |