|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ref.** | **Energy band gap (eV)** | **Reaction temperature (C)** | **Calcination temperature (C)** | **Reaction hour (hr)** | **Calcination hour (hr)** | **Synthesis method** | **Precursor** | **pH** | **Precursor concentration (M)** | **Nanoparticle size (nm)** |
| [1] | 3.788 | 100 |  | 6 |  | Hydrothermal | Zinc acetate | 7 | 0.1 |  |
| [2] | 3.5 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 12 | 0.5 | 25 |
| [3] | 2.57 | 60 | 500 | 2 | 2 | Green | Zinc acetate | 7 | 0.27 | 63.2 |
| [4] | 3.5 | 25 | 300 | 6 | 0.75 | Green | Zinc acetate | 7 | 0.5 |  |
| [5] | 3.31 | 25 | 70 | 24 | 12 | Green | Zinc acetate | 7 | 2 |  |
| [6] | 3.1 | 80 | 120 | 5 |  | Green | Zinc nitrate | 7 | 0.3 |  |
| [7] | 3.25 | 25 | 80 | 2 | 1 | Sol-gel | Zinc acetate | 8 | 0.2 | 49.98 |
| [7] | 3.24 | 25 | 80 | 2 | 1 | Sol-gel | Zinc acetate | 9 | 0.2 | 48.31 |
| [7] | 3.23 | 25 | 80 | 2 | 1 | Sol-gel | Zinc acetate | 10 | 0.2 | 38.32 |
| [7] | 3.14 | 25 | 80 | 2 | 1 | Sol-gel | Zinc acetate | 11 | 0.2 | 36.65 |
| [8] | 3.29 | 25 | 100 | 2 | 12 | Sol-gel | Zinc acetate | 11 |  | 46.45 |
| [9] |  | 25 | 60 | 3 | 4 | Green | Zinc acetate | 7 | 0.001 |  |
| [9] | 2.79 | 25 | 100 | 3 | 4 | Green | Zinc acetate | 7 | 0.001 |  |
| [10] | 3.49 | 70 | 40 | 1 | 12 | Sol-gel | Zinc acetate | 8 | 0.1 | 24.65 |
| [10] | 3.48 | 70 | 40 | 1 | 12 | Sol-gel | Zinc acetate | 9 | 0.1 | 31.7 |
| [10] | 3.47 | 70 | 40 | 1 | 12 | Sol-gel | Zinc acetate | 10 | 0.1 | 48.09 |
| [11] | 3.3 | 60 | 600 | 24 |  | Solvothermal | Zinc acetate | 7 | 0.12 |  |
| [12] | 3.09 | 120 | 300 |  |  | Sol-gel | Zinc acetate | 7 | 0.5 | 31.4 |
| [12] | 3.13 | 120 | 500 | 0.3 |  | Sol-gel | Zinc acetate | 7 | 0.5 | 45.8 |
| [12] |  | 120 | 650 | 0.3 |  | Sol-gel | Zinc acetate | 7 | 0.5 | 48 |
| [12] | 3.16 | 120 | 700 | 0.3 |  | Sol-gel | Zinc acetate | 7 | 0.5 | 54.3 |
| [13] | 2.99 | 180 | 400 | 12 | 2 | Solvothermal | Zinc acetate | 7 | 0.03 | 32.5 |
| [14] | 3.349 | 150 | 60 | 3 |  | Solvothermal | Zinc acetate | 9 | 0.1 | 28.79 |
| [14] | 3.88 | 150 | 60 | 12 |  | Solvothermal | Zinc acetate | 9 | 0.1 | 24.28 |
| [15] | 3.34 | 170 | 60 | 18 | 0.5 | Solvothermal | Zinc acetate | 10 | 0.5 |  |
| [15] | 3.31 | 170 | 60 | 18 | 0.5 | Solvothermal | Zinc acetate | 11 | 0.5 |  |
| [15] | 3.27 | 170 | 60 | 18 | 0.5 | Solvothermal | Zinc acetate | 9 | 0.5 |  |
| [16] | 3.386 | 150 | 80 | 8 | 3 | Solvothermal | Zinc acetate | 7 | 1 | 25 |
| [16] | 3.401 | 150 | 80 | 8 | 3 | Solvothermal | Zinc acetate | 7 | 1 | 19 |
| [16] | 3.408 | 150 | 80 | 8 | 3 | Solvothermal | Zinc acetate | 7 | 1 | 15 |
| [17] | 2.97 | 70 | 500 | 2 | 2 | Green | Zinc acetate | 4 |  | 75 |
| [17] | 3.69 | 70 | 500 | 2 | 2 | Green | Zinc acetate | 6 |  | 64 |
| [17] | 3.9 | 70 | 500 | 2 | 2 | Green | Zinc acetate | 9.5 |  | 70 |
| [17] | 3.97 | 70 | 500 | 2 | 2 | Green | Zinc acetate | 11 |  | 72 |
| [18] | 3.245 | 80 | 80 | 2 |  | Sol-gel | Zinc nitrate | 9 | 0.7 |  |
| [18] | 3.249 | 80 | 80 | 2 |  | Sol-gel | Zinc nitrate | 11 | 0.7 |  |
| [18] | 3.306 | 80 | 80 | 2 |  | Sol-gel | Zinc nitrate | 13 | 0.7 |  |
| [18] | 3.268 | 80 | 80 | 2 |  | Sol-gel | Zinc acetate | 9 | 0.1 |  |
| [18] | 3.25 | 80 | 80 | 2 |  | Sol-gel | Zinc acetate | 11 | 0.1 |  |
| [18] | 3.245 | 80 | 80 | 2 |  | Sol-gel | Zinc acetate | 13 | 0.1 |  |
| [19] | 3.349 | 80 | 400 | 12 | 2 | Sol-gel | Zinc nitrate | 7 | 0.5 | 59 |
| [19] | 3.295 | 80 | 500 | 12 | 2 | Sol-gel | Zinc nitrate | 7 | 0.5 | 83 |
| [20] | 3.536 | 90 | 400 | 2 | 8 | Sol-gel | Zinc nitrate | 7 | 0.34 |  |
| [20] | 3.274 | 90 | 400 | 2 | 8 | Sol-gel | Zinc acetate | 7 | 0.34 |  |
| [21] | 3.09 | 80 | 600 |  |  | Green | Zinc nitrate | 7 | 0.007 |  |
| [21] | 3.13 | 80 | 600 |  |  | Green | Zinc nitrate | 7 | 0.01 |  |
| [21] | 3.17 | 80 | 600 |  |  | Green | Zinc nitrate | 7 | 0.07 |  |
| [21] | 3.05 | 80 | 600 |  |  | Green | Zinc nitrate | 7 | 0.14 |  |
| [21] | 2.9 | 80 | 600 |  |  | Green | Zinc nitrate | 7 | 0.7 |  |
| [21] | 3.16 | 80 | 800 |  |  | Green | Zinc nitrate | 7 |  |  |
| [22] | 3.25 | 60 | 500 | 3 | 2 | Green | Zinc nitrate | 8 |  | 29.61 |
| [22] | 3.18 | 60 | 500 | 3 | 2 | Green | Zinc acetate | 8 |  | 36.75 |
| [23] | 3.79 | 80 | 500 | 2 | 4 | Sol-gel | Zinc nitrate | 7 | 0.34 | 99.28 |
| [23] | 3.05 | 80 | 500 | 2 | 4 | Sol-gel | Zinc acetate | 7 | 0.46 | 40.94 |
| [24] | 3.216 | 140 | 60 | 1 | 12 | Hydrothermal | Zinc acetate | 9 | 0.4 | 90 |
| [24] | 3.22 | 140 | 60 | 1.5 | 12 | Hydrothermal | Zinc acetate | 10 | 0.4 | 100 |
| [25] | 3.47 |  | 50 | 2 | 48 | Green | Zinc acetate | 12 | 0.15 | 42.54 |
| [26] |  | 70 | 380 | 1 | 1 | Sol-gel | Zinc acetate | 7 | 0.3 |  |
| [27] | 3.27 | 120 | 450 | 3 | 2 | Sol-gel | Zinc acetate | 6 | 1.4 | 27.3 |
| [28] | 2.95 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 8 | 0.02 |  |
| [28] | 3 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 9 | 0.02 |  |
| [28] | 3.05 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 10 | 0.02 |  |
| [28] | 3.08 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 11 | 0.02 |  |
| [28] | 3.14 | 25 | 60 | 2 | 12 | Green | Zinc acetate | 12 | 0.02 |  |
| [29] | 3.42 | 80 | 400 |  | 1 | Green | Zinc nitrate | 7 | 0.1 | 12.5 |
| [29] | 3.38 | 80 | 600 |  | 1 | Green | Zinc nitrate | 7 | 0.1 | 20 |
| [29] | 3.35 | 80 | 800 |  | 1 | Green | Zinc nitrate | 7 | 0.1 | 22.5 |
| [30] | 3.23 | 35 | 250 | 1.5 | 4 | Sol-gel | Zinc acetate | 7 | 0.6 | 41.5 |
| [30] | 3.25 | 35 | 250 |  | 4 | Green | Zinc acetate | 7 | 2 | 40 |
| [31] | 3.15 | 90 | 700 |  | 4 | Sol-gel | Zinc nitrate | 5 | 0.7 | 47 |
| [32] | 3.26 | 90 | 80 | 24 | 10 | Hydrothermal | Zinc nitrate | 12 | 1 | 30.62 |
| [32] | 3.25 | 190 | 80 | 24 | 10 | Hydrothermal | Zinc nitrate | 12 | 1 | 45.34 |
| [33] | 3.21 | 70 | 450 | 1 | 4 | Sol-gel | Zinc acetate | 8 | 0.15 | 79.153 |
| [34] | 3.19 | 30 | 400 | 2 | 2 | Sol-gel | Zinc acetate | 7 | 0.25 | 26 |
| [34] | 3.12 | 30 | 400 | 2 | 2 | Sol-gel | Zinc acetate | 7 | 0.25 | 28 |
| [35] | 3.269 | 60 | 400 |  | 2 | Sol-gel | Zinc acetate | 7 | 0.15 | 22 |
| [36] | 3.28 | 40 | 450 | 2 | 4 | Sol-gel | Zinc nitrate | 7 | 0.2 | 32 |
| [37] | 3.29 | 75 | 500 | 8 | 1 | Sol-gel | Zinc nitrate | 7 | 1.5 | 49.39 |
| [38] | 3.3 | 80 | 400 | 10 | 8 | Sol-gel | Zinc nitrate | 7 | 1.5 | 28 |
| [38] | 3.28 | 80 | 500 | 10 | 8 | Sol-gel | Zinc nitrate | 7 | 1.5 | 42 |
| [38] | 3.28 | 80 | 600 | 10 | 8 | Sol-gel | Zinc nitrate | 7 | 1.5 | 51 |
| [39] | 3.31 | 60 | 400 | 1 | 1 | Sol-gel | Zinc acetate | 7 | 0.35 | 27.01 |
| [39] | 3.3 | 60 | 450 | 1 | 1 | Sol-gel | Zinc acetate | 7 | 0.35 |  |
| [39] | 3.29 | 60 | 500 | 1 | 1 | Sol-gel | Zinc acetate | 7 | 0.35 |  |
| [40] | 2.87 | 25 | 100 | 8 | 2 | Sol-gel | Zinc acetate | 9 | 0.75 |  |
| [40] | 3.31 | 25 | 100 | 8 | 2 | Sol-gel | Zinc acetate | 10 | 0.75 |  |
| [40] | 3.47 | 25 | 100 | 8 | 2 | Sol-gel | Zinc acetate | 11 | 0.75 |  |
| [41] | 3.31 | 25 | 100 | 2 | 2 | Sol-gel | Zinc acetate | 7 | 0.5 |  |
| [42] | 3 | 65 | 400 | 0.6 | 2 | Green | Zinc nitrate | 7 | 0.01 |  |
| [43] | 3.24 | 60 | 500 | 3 | 2 | Green | Zinc nitrate | 7 | 0.1 | 37.5 |
| [44] | 3.54 | 50 | 350 | 1 | 3 | Green | Zinc acetate | 7 | 0.2 | 36 |

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