Supporting Information

Table 1 - MO@cellulose
(Part 1 : Controlled growth of metal oxide nanoparticles)

Table 2 - Mixed-MO@cellulose
(Part 1 : Controlled growth of metal oxide nanoparticles)

Table 3- MO@Alginate
(Part 1 : Controlled growth of metal oxide nanoparticles)

Table 4- MO@Chitosan or chitin
(Part 1 : Controlled growth of metal oxide nanoparticles)

Table 5 - MO@Starch, MO@Dextran, MO@Carrageenan, MO@Agarose
(Part 1 : Controlled growth of metal oxide nanoparticles)

Table 6 - Biotemplating of cellulosic fibers to TiO_2@Cellulose and pure TiO_2
(Part 2 : Templating of polysaccharides fibers)

Table 7 - Biotemplating of plants to TiO_2@Plant and pure TiO_2
(Part 2 : Templating of polysaccharides fibers)

Table 8 - Biotemplating of Cellulose to MO@Cellulose and pure MO
(Part 2 : Templating of polysaccharides fibers)

Glossary
PS: polysaccharide  TTIP: Ti(Oct)_4  TEOS : Si(OEt)_4
MO: metal oxide  TTB :Ti(OBu)_4  TMOS : Si(OMe)_4
MMO: mixed metal oxide  SSA: specific surface area
NP: nanoparticles  NP: nanoparticles
MM&SC : mastering morphology and size control
Table 1- MO@cellulose
(Part 1 : Controlled growth of metal oxide nanoparticles)

<table>
<thead>
<tr>
<th>Support</th>
<th>Metal oxide</th>
<th>NP Φ (nm) /SSA (m²g⁻¹)</th>
<th>Potential applications Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton linter pulp in NaOH–thiourea–urea solution</td>
<td>Co₃O₄</td>
<td>5-20 / -</td>
<td>Material for Li-ion battery electrodes³¹</td>
</tr>
<tr>
<td>Cotton cellulose</td>
<td>CeO₂</td>
<td>40-120 / -</td>
<td>Material for UV protection²³</td>
</tr>
<tr>
<td>Bacterial cellulose</td>
<td>Fe₂O₃</td>
<td>10-30 / -</td>
<td>Material for immunoselective absorption³⁵</td>
</tr>
<tr>
<td>Bacterial cellulose Acetobacter xylinum Gluconacetobacter xylinus</td>
<td>Fe₃O₄</td>
<td>5-100 / -</td>
<td>MM&amp;SC¹⁰</td>
</tr>
<tr>
<td>Microcrystalline cellulose in NaOH/urea solution</td>
<td>Fe₃O₄</td>
<td>5-20 / 60-180</td>
<td>Electrochemical and Magnetic material¹¹,¹²,¹³,¹⁴,¹⁵-¹⁷</td>
</tr>
<tr>
<td>Medical cotton in NaOH–thiourea–urea solution</td>
<td>Fe₃O₄</td>
<td>5-20 / 60-180</td>
<td>Absorbent for As(III) and As(V) removal¹⁸</td>
</tr>
<tr>
<td>Cellulose nanocrystal</td>
<td>Ga₂O₃</td>
<td>10-50 / -</td>
<td>MM&amp;SC¹⁹</td>
</tr>
<tr>
<td>Cotton wool</td>
<td>HfO₂</td>
<td>5-10 / -</td>
<td>MM&amp;SC and High-K metal oxide²⁰,²¹</td>
</tr>
<tr>
<td>Cellulose</td>
<td>Mn₃O₄</td>
<td>100 / -</td>
<td>Absorbent for Cr(VI) removal²²</td>
</tr>
<tr>
<td>Hydroxypropyl cellulose</td>
<td>Nb₂O₅</td>
<td>&lt;100 / -</td>
<td>Material for solar energy conversion²³</td>
</tr>
<tr>
<td>Suspension of microcrystalline cellulose powder</td>
<td>NiO</td>
<td>100-60 / -</td>
<td>MM&amp;SC²⁴</td>
</tr>
<tr>
<td>Cellulose nanocrystal from cotton wool</td>
<td>SiO₂</td>
<td>- / 300-500</td>
<td>Hierarchical SBA15-porous silica²⁵</td>
</tr>
<tr>
<td>Cotton cellulose pulp in LiCl/DMAC solution</td>
<td>SnO₂</td>
<td>&lt;50 / -</td>
<td>Composite with electrical conductivity²⁶,²⁷</td>
</tr>
<tr>
<td>Hydroxypropyl cellulose</td>
<td>TiO₂</td>
<td>10-200 / -</td>
<td>MM&amp;SC + mechanical properties²⁸</td>
</tr>
<tr>
<td>Wood cellulose fibres (Eucalyptus globulus),</td>
<td>V₂O₅</td>
<td>50-200 / -</td>
<td>Improved opacity of paper fibers²⁹</td>
</tr>
<tr>
<td>Colloidal solution of nanocrystalline cellulose</td>
<td>V₂O₅</td>
<td>&lt;200 / -</td>
<td>MM&amp;SC and high-K metal oxide³⁰</td>
</tr>
<tr>
<td>Colloidal solution of nanocrystalline cellulose (cotton wool)</td>
<td>V₂O₅</td>
<td>5-10 / -</td>
<td>MM&amp;SC and high-K metal oxide²⁰,²¹</td>
</tr>
<tr>
<td>Colloidal solution of nanocrystalline cellulose</td>
<td>ZnO</td>
<td>50 / -</td>
<td>MM&amp;SC³¹</td>
</tr>
<tr>
<td>Lint-free cellulose paper</td>
<td>ZnO</td>
<td>20-50 / -</td>
<td>MM&amp;SC³²</td>
</tr>
<tr>
<td>Colloidal solution of nanocrystalline cellulose</td>
<td>ZnO</td>
<td>- / -</td>
<td>Fluorescent material¹³</td>
</tr>
<tr>
<td>Freeze-dried bacterial cellulose membrane</td>
<td>ZnO</td>
<td>50-100 / 50-100</td>
<td>Photocatalysis³⁴</td>
</tr>
<tr>
<td>Cotton cellulose pulp</td>
<td>ZnO</td>
<td>100-300 / -</td>
<td>MM&amp;SC³⁵</td>
</tr>
<tr>
<td>Cellulose nanocrystals from filter paper</td>
<td>ZnO</td>
<td>5-20 / -</td>
<td>Antibacterial support³⁶</td>
</tr>
<tr>
<td>Delignified sugarcane bagasse</td>
<td>ZrO₂</td>
<td>50-150 / 36</td>
<td>MM&amp;SC³⁷</td>
</tr>
<tr>
<td>Support</td>
<td>Metal oxide</td>
<td>NP Φ (nm) /SSA (m² g⁻¹)</td>
<td>Potential applications</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Cellulose powder</td>
<td>$\text{Ba}_3\text{Si}<em>6\text{O}</em>{12}\text{N}_2\cdot\text{Eu}^{2+}$</td>
<td>- / -</td>
<td>Luminescent phosphor</td>
</tr>
<tr>
<td>Wood cellulose fibres ($Eucalyptus globulus$)</td>
<td>$\text{BiVO}_4$</td>
<td>$&gt;500$ / -</td>
<td>MM&amp;SC</td>
</tr>
<tr>
<td>Microcrystalline cellulose (Avicel)</td>
<td>$\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8\cdot\text{BiFeO}_3\cdot\text{Y(2%)}$</td>
<td>$&gt;100$ / -</td>
<td>Superconductor</td>
</tr>
<tr>
<td>Cotton linter pulp in lithium hydroxide/urea solution</td>
<td>$\text{CoFe}_2\text{O}_4$</td>
<td>15-50 / 200-300</td>
<td>MM&amp;SC</td>
</tr>
<tr>
<td>Nanocellulose fibers</td>
<td>$\text{Co}<em>{0.5}\text{Cu}</em>{0.5}\text{Fe}_2\text{O}_4$</td>
<td>10-40 / 23</td>
<td>Magnetic support for membrane</td>
</tr>
<tr>
<td>Cellulose</td>
<td>$\text{LiFePO}_4$</td>
<td>35 / -</td>
<td>Material for Li-ion battery cathodes</td>
</tr>
<tr>
<td>Cellulose powder</td>
<td>$\text{LiAlO}_2\cdot\text{Mn}^{2+}$</td>
<td>- / -</td>
<td>Luminescent phosphor</td>
</tr>
<tr>
<td>Microcrystalline cellulose (Avicel)</td>
<td>$\text{Na}_0.5\text{K}_0.5\text{NbO}_3$</td>
<td>$&gt;100$ / -</td>
<td>Piezoelectric material</td>
</tr>
<tr>
<td>Microcrystalline cellulose (Avicel)</td>
<td>$\text{PrCoO}_3\cdot\text{Ni(29%)}$</td>
<td>$&gt;100$</td>
<td>Ferromagnetic material</td>
</tr>
<tr>
<td>Nanofibers from filter paper</td>
<td>$\text{SiO}_2\cdot\text{Fe}_2\text{O}_3$</td>
<td>$&lt;100$ / -</td>
<td>Super-paramagnetic composite</td>
</tr>
<tr>
<td>Crystalline cellulose powder</td>
<td>$\text{YBa}_2\text{Cu}_3\text{O}_x$</td>
<td>- / -</td>
<td>Superconductor material</td>
</tr>
<tr>
<td>Microcrystalline cellulose (Avicel)</td>
<td>$\text{Y}_2\text{O}_3\cdot\text{Eu}^{3+}$</td>
<td>$&gt;100$ / -</td>
<td>Luminescent phosphor</td>
</tr>
<tr>
<td>Hydroxypropyl cellulose</td>
<td>$\text{Y}<em>{0.97}(\text{P}</em>{0.845}\cdot\text{V}_{0.455})\text{O}<em>4\cdot\text{Eu}^{3+}</em>{0.03}$</td>
<td>4-6 / -</td>
<td></td>
</tr>
<tr>
<td>Cellulose</td>
<td>$\text{Y}_2\text{O}_3\cdot\text{Eu}^{3+}$</td>
<td>10-15 / -</td>
<td></td>
</tr>
<tr>
<td>Lint-free cellulose paper</td>
<td>$\text{Y}_2\text{O}_3\cdot\text{Eu}^{3+}$</td>
<td>20-70 / -</td>
<td></td>
</tr>
<tr>
<td>Cellulose pulp</td>
<td>$(\text{Y}<em>{0.5}\text{Eu}</em>{0.5})\cdot\text{(P}<em>{0.5}\cdot\text{V}</em>{0.5})\text{O}_4$</td>
<td>10-70 / -</td>
<td></td>
</tr>
<tr>
<td>(Hydroxypropyl)methyl cellulose</td>
<td>$\text{V}_2\text{O}_5$, $\text{Y}_2\text{O}_3$ and $\text{YVO}_4$ et Eu-doped $\text{YVO}_4$</td>
<td>- / -</td>
<td></td>
</tr>
<tr>
<td>Microcrystalline cellulose (Avicel)</td>
<td>$\text{Y}_3\text{Al}<em>2\text{O}</em>{12}\cdot\text{(Tb(1%))}$</td>
<td>$&gt;100$ / -</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>Metal oxide</td>
<td>NP ( \Phi ) (nm) /SSA (m(^2)g(^{-1}))</td>
<td>Potential applications[^Ref.]</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Sodium alginate</td>
<td>Au@CeO(_2)</td>
<td>5-6/-</td>
<td>Photocatalysis[^54]</td>
</tr>
<tr>
<td></td>
<td>CeO(_2) and Au@CeO(_2)</td>
<td>20-50/-</td>
<td>MM&amp;SC[^55]</td>
</tr>
<tr>
<td></td>
<td>CuO</td>
<td>25-100 /500</td>
<td>MM&amp;SC and catalysis support[^56,57]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200/-</td>
<td>Photocatalysis[^58]</td>
</tr>
<tr>
<td></td>
<td>CuO + Mn(_3)O(_4), and mixed phase</td>
<td>10-100/-</td>
<td>MM&amp;SC and catalysis for toluene oxidation[^59]</td>
</tr>
<tr>
<td></td>
<td>Co(_3)O(_4)</td>
<td>25-100/ 500</td>
<td>MM&amp;SC and catalysis support[^56,57]</td>
</tr>
<tr>
<td></td>
<td>Fe(_2)O(_3)</td>
<td>100/-</td>
<td>Material for magnetic resonance imaging[^60]</td>
</tr>
<tr>
<td></td>
<td>Fe(_2)O(_3)</td>
<td>5-30/-</td>
<td>MM&amp;SC and highly magnetic composite[^61]</td>
</tr>
<tr>
<td></td>
<td>Fe(_3)O(_4)</td>
<td>- / -</td>
<td>Drug delivery and comparison with sodium alginate, bacterial cellulose, chitosan[^62]</td>
</tr>
<tr>
<td></td>
<td>Fe(_3)O(_4)</td>
<td>100/-</td>
<td>Material for magnetic resonance imaging[^60]</td>
</tr>
<tr>
<td></td>
<td>Mn(_3)O(_4)</td>
<td>10-100/-</td>
<td>Catalysis for toluene oxidation[^59]</td>
</tr>
<tr>
<td></td>
<td>NiO</td>
<td>25-100/500</td>
<td>MM&amp;SC and catalysis support[^56,57]</td>
</tr>
<tr>
<td></td>
<td>Pb[Zr(<em>x)Ti(</em>{1-x})]O(_3)</td>
<td>&lt;50/-</td>
<td>Piezoelectric nanowire[^63]</td>
</tr>
<tr>
<td></td>
<td>SiO(_2)</td>
<td>&lt; 100/-</td>
<td>MM&amp;SC and comparison : chitosan (\kappa, \lambda, ) and (\iota) carrageenan[^64-66]</td>
</tr>
<tr>
<td></td>
<td>TiO(_2)</td>
<td>10-100/100-200</td>
<td>Morphology, size control and organic functionalization[^67]</td>
</tr>
<tr>
<td></td>
<td>WO(_3)</td>
<td>5-6/-</td>
<td>Photocatalysis (+ Au@TiO(_2))[^68]</td>
</tr>
<tr>
<td></td>
<td>YBa(_3)Cu(_4)O(_8)</td>
<td>Fibrous particles</td>
<td>Superconducting material[^69]</td>
</tr>
<tr>
<td></td>
<td>ZrO(_2)</td>
<td>20-50/-</td>
<td>MM&amp;SC[^55]</td>
</tr>
<tr>
<td>Sodium and ammonium alginate</td>
<td>La(<em>{0.67})Sr(</em>{0.33})MnO(_3)</td>
<td>10-100/-</td>
<td>Superconducting material[^70]</td>
</tr>
</tbody>
</table>
### Table 4- MO@Chitosan or chitin
(Part 1 : Controlled growth of metal oxide nanoparticles)

<table>
<thead>
<tr>
<th>Support</th>
<th>Metal oxide</th>
<th>NP Φ(nm) / SSA (m²·g⁻¹)</th>
<th>Potential applications Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chitosan</td>
<td>Al₂O₃</td>
<td>- / 465</td>
<td>Support for Ni-catalyzed processes⁷¹</td>
</tr>
<tr>
<td>Chitosan (90% deacetylation)</td>
<td>Al₂O₃</td>
<td>- / 100-450</td>
<td>Material for catalysis ⁷²-⁷⁴</td>
</tr>
<tr>
<td>Chitosan</td>
<td>SnO₂</td>
<td>- / 100-450</td>
<td>Material for catalysis support ⁷²-⁷⁴</td>
</tr>
<tr>
<td>Chitosan (92.5% deacetylation)</td>
<td>SnO₂</td>
<td>-/-</td>
<td>Enzyme carrier for glucose oxidase⁷⁵, ⁷⁶</td>
</tr>
<tr>
<td>Chitosan</td>
<td>SiO₂</td>
<td>-/-</td>
<td>Ph-sensitive membrane⁷⁷</td>
</tr>
<tr>
<td>Chitosan (85% deacetylation)</td>
<td>SiO₂</td>
<td>-/-</td>
<td>Improved thermal and mechanical properties of composite⁷⁸</td>
</tr>
<tr>
<td>High molecular chitosan</td>
<td>SiO₂</td>
<td>-/-</td>
<td>Support for chromatography⁷⁹</td>
</tr>
<tr>
<td>Chitosan (90% deacetylation)</td>
<td>SiO₂</td>
<td>- / 200-300</td>
<td>MM&amp;SC and catalysis support ⁵⁷, ⁸⁰</td>
</tr>
<tr>
<td>Chitin nanocrystal</td>
<td>SiO₂</td>
<td>7-8 /200-300</td>
<td>MM&amp;SC and catalysis support ⁷⁴, ⁸⁵</td>
</tr>
<tr>
<td>Chitosan</td>
<td>TiO₂</td>
<td>- / 43</td>
<td>Comparison with furfural and saccharose Material for solar cells⁸⁶</td>
</tr>
<tr>
<td>Chitin nanocrystal</td>
<td>TiO₂</td>
<td>- / 70-445</td>
<td>MM&amp;SC and photocatalysis⁸⁷</td>
</tr>
<tr>
<td>Chitosan</td>
<td>TiO₂</td>
<td>- / 70-445</td>
<td>MM&amp;SC and catalysis support ⁷⁴, ⁸⁵</td>
</tr>
<tr>
<td>Chitosan</td>
<td>WO₃</td>
<td>42 / --</td>
<td>Material for water-splitting⁸⁸</td>
</tr>
<tr>
<td>Chitosan (85% deacetylation)</td>
<td>YBa₂Cu₄O₸</td>
<td>Nano-needles 500 x 10</td>
<td>High-Tc superconducting nanowires⁸⁹</td>
</tr>
<tr>
<td>Chitosan (90% deacetylation)+ poly (vinyl alcohol)</td>
<td>ZnO</td>
<td>- / -</td>
<td>Material for antibacterial film⁹⁰</td>
</tr>
<tr>
<td>Chitosan (90% deacetylation)</td>
<td>ZrO₂</td>
<td>- / 100-450</td>
<td>MM&amp;SC and catalysis support ⁷²-⁷⁴</td>
</tr>
</tbody>
</table>
### Table 5 - MO@Starch, MO@Dextran, MO@Carrageenan, MO@Agarose

(Part 1 : Controlled growth of metal oxide nanoparticles)

<table>
<thead>
<tr>
<th>Support</th>
<th>Metal oxide</th>
<th>NP Ø (nm) / SSA (m² g⁻¹)</th>
<th>Potential applications</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starch</td>
<td>TiO₂</td>
<td>25/72</td>
<td>Photocatalysis comparison with cyclodextrin and chitosan⁸⁷</td>
<td></td>
</tr>
<tr>
<td>Starch</td>
<td>SiO₂</td>
<td>23/50-100</td>
<td>MM&amp;SC and catalysis support⁹²</td>
<td></td>
</tr>
<tr>
<td>Carboxymethyl starch</td>
<td>SiO₂</td>
<td>-/-</td>
<td>Powder for electro-rheological fluids⁹²</td>
<td></td>
</tr>
<tr>
<td>Potato starch</td>
<td>TiO₂</td>
<td>10-150/ -</td>
<td>MM&amp;SC and comparison with cellulose⁹⁶</td>
<td></td>
</tr>
<tr>
<td>Starch amylose</td>
<td>SiO₂</td>
<td>100-200 / -</td>
<td>MM&amp;SC and core-shell SiO₂@amylose NP⁹⁴</td>
<td></td>
</tr>
<tr>
<td>Native starch modified with urea or thiourea</td>
<td>SiO₂</td>
<td>50-100 /200-300</td>
<td>Hybrid material for absorption of metal cations⁹⁵</td>
<td></td>
</tr>
<tr>
<td>Potato starch in ionic liquid</td>
<td>ZnO</td>
<td>10/-</td>
<td>MM&amp;SC by seeding layer for ZnO nanorod growth⁹⁷</td>
<td></td>
</tr>
<tr>
<td>Soluble starch in aqueous media</td>
<td>ZnO</td>
<td>10/-</td>
<td>MM&amp;SC⁹⁸</td>
<td></td>
</tr>
<tr>
<td>Dextran</td>
<td>Ag@CuO₅⁺</td>
<td>- / -</td>
<td>M&amp;SC and magnetic sponges⁹⁹</td>
<td></td>
</tr>
<tr>
<td>Dextran</td>
<td>Fe₃O₄</td>
<td>10-100/ 10-20</td>
<td>M&amp;SC and catalysis support¹⁰⁰</td>
<td></td>
</tr>
<tr>
<td>Dextran</td>
<td>YBa₂Cu₄O₇</td>
<td>60 / -</td>
<td>Sponge-like superconducting material¹⁰¹</td>
<td></td>
</tr>
<tr>
<td>K, λ, and τ Carrageenan</td>
<td>Fe₃O₄</td>
<td>5-15/-</td>
<td>MM&amp;SC and catalysis support¹⁰²</td>
<td></td>
</tr>
<tr>
<td>K, λ, and τ Carrageenan</td>
<td>Ni(OH)₂, Co(OH)</td>
<td>-/-</td>
<td>MM&amp;SC¹⁰⁴</td>
<td></td>
</tr>
<tr>
<td>K, λ, and τ Carrageenan</td>
<td>SiO₂</td>
<td>8-12/-</td>
<td>Membrane for biocatalysis¹⁰⁵</td>
<td></td>
</tr>
<tr>
<td>Agarose</td>
<td>ZrO₂-TiO₂</td>
<td>10-20/50-300</td>
<td>MM&amp;SC and catalysis support¹⁰⁶</td>
<td></td>
</tr>
<tr>
<td>Agarose</td>
<td>ZrO₂-TiO₂</td>
<td>- /30-70</td>
<td>MM&amp;SC¹⁰⁷</td>
<td></td>
</tr>
<tr>
<td>Agarose</td>
<td>TiO₂</td>
<td>10-15/5-70</td>
<td>MM&amp;SC and support for chromatography¹⁰⁸</td>
<td></td>
</tr>
<tr>
<td>Agarose</td>
<td>TiO₂ and Au@TiO₂</td>
<td>10-30/260-60</td>
<td>Photocatalyst¹⁰⁹</td>
<td></td>
</tr>
<tr>
<td>Agarose</td>
<td>Al₂O₃-TiO₂</td>
<td>10-15/50-200</td>
<td>Photocatalyst¹¹⁰</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6 - Biotemplating of cellulosic fibers to TiO$_2$@Cellulose and pure TiO$_2$

(Part 2: Templating of polysaccharides fibers)

<table>
<thead>
<tr>
<th>Support</th>
<th>Precursor /Process</th>
<th>SSA ($m^2$ g$^{-1}$)</th>
<th>Potential Applications</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton fibers and wool</td>
<td>Impregnation with TTB sol</td>
<td>250-275</td>
<td>Photocatalysis</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTIP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTB and ammonium ceric nitrate sol</td>
<td>250-260</td>
<td>Ce-doped TiO$_2$</td>
<td>113</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTB solution + direct calcination</td>
<td>5-10</td>
<td>Photocatalysis</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Impregnation with (NH$_4$)$_2$TiF$_6$</td>
<td>50</td>
<td>Material for photoanode</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TiCl$_4$ hexane solution</td>
<td>50</td>
<td>MM&amp;SC</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TiF$_4$ aqueous solution</td>
<td>50-70</td>
<td>Photocatalysis</td>
<td>117, 118</td>
</tr>
<tr>
<td>Filter paper</td>
<td>TTB</td>
<td>-</td>
<td>Material for photocatalysis and</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>Impregnation TTIP sol + Ag NP</td>
<td>35-65</td>
<td>electrochemistry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTIP sol + flame calcination</td>
<td>10</td>
<td>MM&amp;SC</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTB sol</td>
<td>400</td>
<td>Photocatalysis</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>ALD with Ti(OMe)$_4$</td>
<td>5-20</td>
<td>MM&amp;SC</td>
<td>123, 124</td>
</tr>
<tr>
<td></td>
<td>Impregnation with TTB sol + Au NP</td>
<td>-</td>
<td>MM&amp;SC</td>
<td>125, 126</td>
</tr>
<tr>
<td>Bacterial cellulose</td>
<td>Impregnation of TTB sol + Hydrothermal process (150°C) + urea addition Acetobacter xylinum</td>
<td>200-250</td>
<td>Photocatalysis</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>TTIP sol</td>
<td>-</td>
<td>Photocatalysis</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Impregnation of TTB sol with Suzhou sweet wine koji bacterial cellulose</td>
<td>60</td>
<td>Photocatalysis</td>
<td>129</td>
</tr>
<tr>
<td>Powdered cellulose</td>
<td>Impregnation of TBTand hydrolyzed in air sol</td>
<td>3-25</td>
<td>MM&amp;SC</td>
<td>130</td>
</tr>
<tr>
<td>Cellulose nanocrystals from filter paper</td>
<td>Impregnation of TBT and hydrolyzed in air sol</td>
<td></td>
<td>MM&amp;SC</td>
<td>131</td>
</tr>
<tr>
<td>Regenerated cellulose</td>
<td>Impregnation of TTB sol</td>
<td>-</td>
<td>Photocatalysis</td>
<td>132</td>
</tr>
<tr>
<td>Support</td>
<td>Precursor / Process</td>
<td>SSA (m² g⁻¹)</td>
<td>Potential Applications</td>
<td>Ref.</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------------------------------------</td>
<td>--------------</td>
<td>------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Ramie fibers</td>
<td>Impregnation of TTB sol</td>
<td>&lt;5</td>
<td>Photocatalysis</td>
<td>133</td>
</tr>
<tr>
<td>Bamboo fibers</td>
<td>Impregnation of TiCl₄ sol</td>
<td>50-60</td>
<td>Photocatalysis</td>
<td>134</td>
</tr>
<tr>
<td>Fern, jade, coralberry and ZZ plants</td>
<td>Impregnation of neat TTIP + Water vapour exposure</td>
<td>30-60</td>
<td>MM&amp;SC</td>
<td>135</td>
</tr>
<tr>
<td>Soft rushes</td>
<td>Impregnation of TTIP in 2-propanol</td>
<td>30-40</td>
<td>Photocatalysis</td>
<td>136</td>
</tr>
<tr>
<td>Skin of tomatoes, onion bulbd, grapes, and garlic bulbs</td>
<td>Impregnation of TTIP in 2-propanol + water impregnation</td>
<td>60-70</td>
<td>Photocatalysis</td>
<td>137</td>
</tr>
<tr>
<td>Linn leaves</td>
<td>Multi-step processing TiCl₃ aq. sol or TTB /acac EtOH sol</td>
<td>100</td>
<td>Photocatalysis</td>
<td>138</td>
</tr>
<tr>
<td>Jute</td>
<td>TiCl₄ aq. sol</td>
<td>-</td>
<td>MM&amp;SC</td>
<td>139, 140</td>
</tr>
<tr>
<td>Cropt seeds</td>
<td>TiCl₃ aqueous solution</td>
<td>50-60</td>
<td>N–P-codoped TiO₂ Material for Photocatalysis</td>
<td>141</td>
</tr>
<tr>
<td>Support</td>
<td>Metal oxide</td>
<td>Precursors / Process</td>
<td>SSA m² g⁻¹</td>
<td>Potential Application</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cotton wool</td>
<td>Al₂O₃</td>
<td>ALD processing Al(CH₃)₃</td>
<td>-</td>
<td>MM&amp;SC 142</td>
</tr>
<tr>
<td>Jute</td>
<td>Al₂O₃</td>
<td>Al₂O₃</td>
<td>200-500</td>
<td>MM&amp;SC 140</td>
</tr>
<tr>
<td>Rattan Calamus rotang</td>
<td>Al₂O₃, Al₂O₃/ZnO</td>
<td>Al and Zn metal (CVD + oxidation)</td>
<td></td>
<td>Luminescent material 143</td>
</tr>
<tr>
<td>Native cellulose of southern yellow pine</td>
<td>Al₂O₃–V₂O₅</td>
<td>ALD Al[CH₃H] VO(OCH₃H)₃</td>
<td>&lt;5</td>
<td>V₂O₅/CNT/cellulose for electrodes 144</td>
</tr>
<tr>
<td>Bacterial cellulose</td>
<td>Fe₂O₃</td>
<td>Aq. Sol. of FeCl₃ and FeCl₂</td>
<td>NP Ø 15nm</td>
<td>Adsorbents for metal ions 145</td>
</tr>
<tr>
<td>Cotton fiber</td>
<td>LiCoO₂ and Li(NiMnCo)₂O₂</td>
<td>NP Ø 100-500nm</td>
<td>Material for Li-ion battery cathodes 146</td>
<td></td>
</tr>
<tr>
<td>Filter paper</td>
<td>LiMn₂O₄</td>
<td>Aq. Sol. Li(NO₃) Mn(CH₃CO₂)₂</td>
<td>–</td>
<td>MM&amp;SC</td>
</tr>
<tr>
<td>Lens paper</td>
<td>MnO₂</td>
<td>KMnO₄ + Oleic acid</td>
<td>NP Ø 50-200 nm</td>
<td>Catalyst for oxidation of formaldehyde 148</td>
</tr>
<tr>
<td>Rice paper</td>
<td>MoO₃</td>
<td>(NH₄)₆(Mo₇O₂₄)(H₂O)₄</td>
<td>NP Ø 200 nm</td>
<td>MM&amp;SC 150</td>
</tr>
<tr>
<td>Regenerated cellulose aerogel</td>
<td>SiO₂</td>
<td>TEOS</td>
<td>400-700</td>
<td>MM&amp;SC 151</td>
</tr>
<tr>
<td>Filter paper</td>
<td></td>
<td>SiO₂</td>
<td>600-800</td>
<td>MM&amp;SC - Silica nanotube 152</td>
</tr>
<tr>
<td>Ashless filter paper</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 20-40nm</td>
<td>MM&amp;SC - Silica nanotube and nanowire 154</td>
</tr>
<tr>
<td>Cellulose nanorod</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 20-40nm</td>
<td>MM&amp;SC - Silica nanotube and nanowire 154</td>
</tr>
<tr>
<td>Cellulose nanorod suspension</td>
<td>TEOS</td>
<td></td>
<td>10-100</td>
<td>Hierarchical porous silica 155</td>
</tr>
<tr>
<td>Powdered cellulose</td>
<td>V₂O₅</td>
<td>(TTIP) + VO(OCH₃H)₃</td>
<td>-</td>
<td>Conductive photoswitchable material 156, 157</td>
</tr>
<tr>
<td>Regenerated cellulose aerogel</td>
<td>ZnO</td>
<td>ALD with ZnEt₂</td>
<td>-</td>
<td>Material for electrochemical devices 158</td>
</tr>
<tr>
<td>Filter paper</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 10-25nm</td>
<td>Materials for photocatalysis 159</td>
</tr>
<tr>
<td>Bacterial cellulose</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 200-700nm</td>
<td>MM&amp;SC 160</td>
</tr>
<tr>
<td>Disintegrated eucalyptus globulus fibers</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 10-30nm</td>
<td>MM&amp;SC 161</td>
</tr>
<tr>
<td>Whatman filter paper (40)</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 60-90nm</td>
<td>Photocatalysis 162</td>
</tr>
<tr>
<td>Microcrystalline cellulose powder</td>
<td>ZnO</td>
<td>[Zn(CH₂CO₂)₂]</td>
<td>NP Ø 10-150nm</td>
<td>MM&amp;SC 96</td>
</tr>
<tr>
<td>Uzbekistan cotton fibers</td>
<td>ZrO₂</td>
<td>(Zr(OH)₄).</td>
<td>10-15</td>
<td>Photoluminescent cellulose-ZnO membrane 163</td>
</tr>
<tr>
<td>Filter paper</td>
<td>ZrO₂</td>
<td>(Zr(OH)₄).</td>
<td>5-30</td>
<td>MM&amp;SC 126</td>
</tr>
<tr>
<td>Powdered cellulose</td>
<td>ZrO₂</td>
<td>(Zr(OH)₄).</td>
<td>5-30</td>
<td>MM&amp;SC 126</td>
</tr>
<tr>
<td>Cellulose microcrystalline</td>
<td>ZnO@Al₂O₃</td>
<td>Al and Zn metal (CVD + oxidation)</td>
<td>-</td>
<td>Luminescent materials 143</td>
</tr>
<tr>
<td>Regenerated cellulose aerogel</td>
<td>ZnO@Al₂O₃</td>
<td>Al and Zn metal (CVD + oxidation)</td>
<td>-</td>
<td>Luminescent materials 143</td>
</tr>
</tbody>
</table>
REFERENCES