Abstract: The invention relates to Group 1 metal/porous metal oxide compositions comprising porous metal oxide selected from porous titanium oxide and porous alumina and an alkali metal or an alkali metal alloy. The compositions of the inventions are described as Stage 0 and I materials. These materials differ in their preparation and chemical reactivity. Each successive stage may be prepared directly using the methods described below or from an earlier stage material. Stage 0 materials may, for example be prepared using liquid alloys of Na and K which are rapidly absorbed by porous metal oxide under isothermal conditions, preferably at or just above room temperature, to form loose black powders that retain much of the reducing ability of the parent metals. When the low melting Group 1 metals are absorbed into the porous metal oxide at about 150°C, an exothermic reaction produces Stage 1 material, loose black powders that are stable in dry air. Further heating forms higher stage materials of unknown composition. It is believed that Stage I higher metal oxide compositions represent reductions of the porous metal oxide after absorption of the Group 1 metal. Preferred Group 1 metal/porous metal oxide compositions of the invention are those containing sodium, potassium, or sodium-potassium alloys with sodium and sodium-potassium alloys being most preferred. Each stage of the Group 1 metal/porous metal oxide composition of the invention may be used as a reducing agent reacting with a number of reducible organic materials in the same manner known for alkali metals and their alloys.
NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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**INTERNATIONAL SEARCH REPORT**

**CLASSIFICATION OF SUBJECT MATTER**

IPC: B01J 23/00(2006.01),23/02(2006.01),23/04(2006.01),23/08(2006.01),20/00(2006.01),21/04(2006.01),31/00(2006.01),37/00(2006.01);C07F 1/02(2006.01);C07B 3/08(2006.01);C07C 17/25(2006.01)


According to International Patent Classification (IPC) or to both national classification and IPC

**FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)


Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
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Further documents are listed in the continuation of Box C. - See patent family annex.

- "A" - document defining the general state of the art which is not considered to be of particular relevance
- "B" - earlier application or patent published on or after the international filing date
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- "O" - document referring to an oral disclosure, use, exhibition or other means
- "P" - document published prior to the international filing date but later than the priority date claimed

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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