METHOD AND COMPOSITION FOR ELECTRO-CHEMICAL-MECHANICAL POLISHING

Methods and compositions for electro-chemical-mechanical polishing (e-CMP) of silicon chip interconnect materials, such as copper, are provided. The methods include the use of compositions according to the invention in combination with pads having various configurations.
A. CLASSIFICATION OF SUBJECT MATTER
   IPC(8) - H01L 21/302 (2007.1)
   USPC - 438/692
   According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
   Minimum documentation searched (classification system followed by classification symbols)
   USPC - 438/692

   Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
   USPC - 205/647, 674; 438/691, 692 (see key words below)
   IPC(8) - H01L 21/302 (2007.1)

   Electronic database consulted during the international search (name of database and, where practicable, search terms used)
   Electronic Databases Searched: USPTO WEST (PGPUB, USPT, EPAB, JPAB), Google, Thomson dialog. Search Terms Used: propanediol, glycerol, glycol?, diol, surfactant?, solvent, polish?, polishing, composition, solvent and water, electro or chemical or mechanical and polishing, electro-chemical-polishing, cetyltrimethylammonium.

C. 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>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2004/0248412 A1 (Liu et al.) 09 December 2004 (09.12.2004) entire text especially para [0026]; [0048]; [0063]; [0066]; [0068]; [0073]; [0075]; [0076]; [0087]; [0092]; [0094]; [0106]; [0111]; [0113]; [0284].</td>
<td>1-53</td>
</tr>
</tbody>
</table>

* Further documents are listed in the continuation of Box C.

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "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
- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "Y" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "X" document member of the same patent family

Date of the actual completion of the international search: 06 May 2007 (06.05.2007)
Date of mailing of the international search report: 25 JUL 2007

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