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(54) Title: LATEX FOR LOW VOC PAINT HAVING IMPROVED BLOCK RESISTANCE, OPEN TIME AND WATER-SOFTENING RESISTANCE

(57) Abstract: The invention is directed to latex compositions comprising sequentially designed polymer having a first stage, a second stage and a third stage corresponding to a seed, a core and a shell. The latex polymer is suitable for aqueous low volatile organic compounds ("VOC") paint (less than 50 g/L) with good block resistance, improved open time and increased water softening resistance. To attain good block resistance, the seed and the core contain monomers that form polymers with relatively harder characteristics and higher glass transition temperature ("T_g") while the shell contains monomers that form polymers with softer characteristics and lower T_g. To gain improved open time, the latex polymer contains suitable level of hydrophilic monomers necessary to hold water. To achieve water softening resistance, hydrophobic monomers are grafted on hydrophilic portions of the shell or the core layers. The invention is also directed to the process of making the latex by a sequential emulsion polymerization.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 07/77277

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - C08F 230/08 (2007.10)
USPC - 524/806; 526/279
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 524/806; 526/279

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC 526/319; 524/522, 524/523

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PUBWEST (USPT, PGPB, USOC, EPAB and JPAB); Google Scholar.
Search terms: polymer, paint, seed, glass transition temperature, intermediate stage, aggregate glass transition temperature, Tg(-), core, shell, volatile organic compounds, bases, sequential, multi stage, hydrophilic (see search History)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,880,842 A (KOWALSKI et al), 14 November 1989 (14.11.1989), col 2, ln 13-23, 62-65, 38-39; col 9, ln 35, 6-8; col 8, ln 31-43, 55-66; col 4, ln 62-65; col 3, ln 37-61, 65-68, 1-4; col 5, ln 20-24; col 6, ln 23-26.	1-37
Y	US 6,538,062 B2 (SAKAGUCHI et al), 25 March 2003 (25.03.2003), col 1, ln 4-7, 48-53, 58-67; col 2, ln 23-27, 1-16; col 3, ln 13-20, 63-66; col 4, ln 36, 1.	1-19, 25, 26, 30, 31, 34, 38
Y	US 5,308,890 A (SNYDER) 03 May 1994 (03.05.1994), col 3, ln 3-9; col 1, ln 6-15; col 2, ln 13-19.	27-29
Y	US 6,610,776 B2 (LAUBENDER et al), 26 August 2003 (26.08.2003), col 1, ln 4-8, 54-56, 63-66.	32-34
Y	US 5,639,805 A (PARK et al), 17 June 1997 (17.06.1997), col 3, ln 60-64, 67; col 4, ln 1-8; col 1, ln 12-16; col 7, ln 4-5; col 8, ln 26-33.	38, 20-26
Y	US 5,021,469 A (LANGERBEINS et al), 04 June 1991 (04.06.1991), col 1, ln 53-57, 4-5, 63-65; col 3, ln 7-9, 27-37, 13-16, 65-68, 53-54, 40-47.	1-14, 16-26
Y	US 4,325,856 A (ISHIKAWA et al), 20 April 1982 (20.04.1982), col 1, ln 64-67, 6-11; col 2, ln 58-64; col 8, ln 51-61; col 9, ln 8-25.	35-37
Y	US 5,342,883 A (JENKINS et al), 30 August 1994 (30.08.1994), col 4, ln 1-7, 20-21, 17-18; col 1, ln 24-27.	35-37

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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