Title: PERSPECTIVES ON ALTERNATIVES TO PHTHALATE PLASTICIZED POLY(VINYL CHLORIDE) IN MEDICAL DEVICES APPLICATIONS

Author: <ce:author id="aut0005"> Federica Chiellini<ce:author id="aut0010"> Marcella Ferri<ce:author id="aut0015"> Andrea Morelli<ce:author id="aut0020"> Lucia Dipaola<ce:author id="aut0025"> Giuseppe Latini

PII: S0079-6700(13)00018-X
DOI: http://dx.doi.org/doi:10.1016/j.progpolymsci.2013.03.001
Reference: JPPS 779

To appear in: *Progress in Polymer Science*

Received date: 8-8-2012
Revised date: 4-3-2013
Accepted date: 8-3-2013

Please cite this article as: Chiellini F, Ferri M, Morelli A, Dipaola L, Latini G, PERSPECTIVES ON ALTERNATIVES TO PHTHALATE PLASTICIZED POLY(VINYL CHLORIDE) IN MEDICAL DEVICES APPLICATIONS, *Progress in Polymer Science* (2013), http://dx.doi.org/10.1016/j.progpolymsci.2013.03.001

PERSPECTIVES ON ALTERNATIVES TO PHTHALATE PLASTICIZED POLY(VINYL CHLORIDE) IN MEDICAL DEVICES APPLICATIONS

Federica Chiellini,[1*] Marcella Ferri,[1] Andrea Morelli,[1] Lucia Dipaola,[3] Giuseppe Latini[2,3]

1. BIOlab, Department of Chemistry and Industrial Chemistry, University of Pisa, Via Risorgimento 35, 561267 Pisa, Italy

2. Division of Neonatology, Perrino Hospital, Brindisi, Italy

3. Clinical Physiology Institute, National Research Council of Italy (IFC-CNR), Italy

*** Corresponding author. Tel:+39 050 2210305; fax: +39 050 2210332; e-mail address:** federica@dcci.unipi.it **(Federica Chiellini)**

Abstract

Poly(vinyl chloride) (PVC) is one of the most important polymeric materials available today and is used to manufacture many items, ranging from packaging and toys to healthcare devices. PVC is *per se* a rigid material but it is made softer by compounding with plasticizers, particularly phthalate esters such as di-(2-ethylhexyl) phthalate (DEHP). In flexible plasticizer PVC (P-PVC), phthalates are not chemically bound to PVC and they are released into the external environment. In particular, prolonged contact of P-PVC based medical devices with body fluids or tissues has been shown to be associated with severe health risks. Major concerns regarding the safety of P-PVC in medical plastic items have been raised, and several alternatives to phthalates and to P-PVC itself as well as chemical/physical treatments of P-PVC to reduce DEHP migration have been proposed.

This review outlines recent scientific approaches for preventing DEHP contamination of humans by P-PVC medical devices, highlighting the impact of the proposed alternative materials on human health and strategies for implementing them.

Keywords: Poly(vinyl chloride), Phthalates, Plasticizers, Medical Devices