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3 Green Solvents for Edible Oils Extraction

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3.1 INTRODUCTION

In this day and age, the search for efficient and eco-friendly processes to extract quality edible oil from various naturally occurring plant materials has been the focus of study for many industrial engineers and scientists from around the globe. Prior to solvent extraction, preconditioning of the plant material including cleaning, cracking, and flaking is paramount to obtain a maximum level of edible oil rich products (Pohl 1991). One of the main challenges currently confronted by the industrial community is the utilization of nonhazardous and naturally abundant green solvents during the extraction process (Pohl 1991); to this date, the utilization of hazardous eluents such as n-hexane as the main and primary solvent of choice to extract a wide range of fatty acids containing edible oils has been routinely explored since the idea was first patented by Pascal et al. in 1946 (Pascal 1949). In the event, up to 98% of vegetable oils can be extracted from oil-rich materials using n-hexane. However, the latter solvent can pose great risks to industry and consumers alike; the highly flammable nature of n-hexane in conjunction with its noticeable volatility requires users to follow extra care and abide by special procedures when handling it (ATSDR 1999). On the other hand, during solvent evaporation and recovery stage,