# Analytical study on certain leached components from plastic and metallic packages

**A Thesis**

Presented for the partial fulfillment of

**Master Degree in Pharmaceutical Sciences**

**(Pharmaceutical Analytical Chemistry)**

**By**


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# Approval Sheet

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## Analytical study on certain leached components from plastic and metallic packages


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***Ola Moataz***

# Table of Contents

# List of Abbreviations

| | |
|---|---|
| **ANOVA** | **Analysis of variance** |
| **APCI** | **Atmospheric pressure chemical ionization** |
| **AuNPs** | **Gold nanoparticles** |
| **β-CDP** | **β-cyclodextrin polymer** |
| **BADGE** | **Bisphenol -A- diglycidyl ether** |
| **BADGE·2HCl** | **Bisphenol A bis(3-chloro-2-hydroxypropyl)ether** |
| **BADGE·$H_2O$** | **Bisphenol-A-(2,3-dihydroxypropyl) glycidyl ether** |
| **BADGE·HCl·$H_2O$** | **Bisphenol-A-(3-chloro-2-hydroxypropyl) (2,3-dihydroxypropyl)ether** |
| **BFDGE** | **Bisphenol-F-diglycidyl ether** |
| **BP** | **Biphenol** |
| **BPA** | **Bisphenol A** |
| **BPAF** | **Bisphenol AF** |
| **BPAP** | **Bisphenol AP** |
| **BPB** | **Bisphenol B** |
| **BPE** | **Bisphenol E** |
| **BPF** | **Bisphenol F** |
| **BPP** | **Bisphenol P** |

| | |
|---|---|
| **BPS** | **Bisphenol S** |
| **BPZ** | **Bisphenol Z** |
| **B-R buffer** | **Britton-Robinson buffer** |
| **CC** | **Chronocoulometry** |
| **C-dots** | **Carbon dots** |
| **CE** | **Capillary electrophoresis** |
| **CL** | **Chemiluminescence** |
| **CPE** | **Carbon paste electrode** |
| **CV** | **Cyclic voltammetry** |
| **CZE** | **Capillary zone electrophoresis** |
| **DAD** | **Diode array detection** |
| **DPV** | **Differential pulse voltammetry** |
| **ECL** | **Electrochemiluminescence** |
| **EDC** | **Endocrine disruptor chemical** |
| **EI** | **Electron ionization** |
| **ESI** | **Electrospray ionization** |
| **EU** | **European Union** |
| **FCMs** | **Food contact materials** |
| **FI-CL** | **Flow injection Chemiluminescence method** |
| **GC** | **Gas chromatography** |
| **GCE** | **Glassy carbon electrode** |

| | |
|---|---|
| **HPLC** | **High-performance liquid chromatography** |
| **HRP** | **Horseradish peroxidase enzyme** |
| **ICH** | **International Conference on Harmonization** |
| **IUPAC** | **International Union of Pure and Applied Chemistry** |
| **LC** | **Liquid chromatography** |
| **LOD** | **Limit of detection** |
| **LOQ** | **Limit of quantitation** |
| **LVs** | **Latent variables** |
| **MEKC** | **Micellar electrokinetic chromatography** |
| **MIF** | **Molecular imprinted film** |
| **MIP** | **Molecular imprinted polymer** |
| **MS** | **Mass spectrometry** |
| **MS/MS** | **Tandem mass spectrometry** |
| **MWCNTs** | **Mutli-walled carbon nanotubes** |
| **NA** | **Not Available** |
| **p=0.05** | **The probability of results in 95%** |
| **PCR** | **Principal component regression** |
| **PDA** | **Photodiode array** |
| **PGE** | **Pencil graphite electrode** |
| **PLS** | **Partial least squares** |

| | |
|---|---|
| **R%** | **Recovery percent** |
| **r** | **Correlation coefficient** |
| **RSD** | **Relative standard deviation** |
| **% RSD** | **Percentage relative standard deviation** |
| **SCF** | **Scientific Committee on Food** |
| **SD** | **Standard deviation** |
| **SMLs** | **Specific migration limits** |
| **SWCNTs** | **Single-walled carbon nanotubes** |
| **SWV** | **Square wave voltammetry** |
| **TBBPA** | **Tetrabromobisphenol A** |
| **TCBPA** | **Tetrachlorobisphenol A** |
| **TD-GC-MS** | **Thermal desorption gas chromatography mass spectrometry** |
| **t-test** | **Student “t” test** |
| **UHPLC** | **Ultra high-performance liquid chromatography** |
| **UPLC** | **Ultra performance liquid chromatography** |
| **UV** | **Ultraviolet** |

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