Parana Journal of Science and Education (PJSE) – v.4, n.6, (1-17) August 9, 2018
ISSN: 2447-6153 *https://sites.google.com/site/pjsciencea*

A Novel Approach to Reduce Toxicities and to Improve Bioavailabilities of DNA/RNA of Human Cancer Cells–Containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as Anti–Cancer Nano Drugs by Coassembly of Dual Anti–Cancer Nano Drugs to Inhibit DNA/RNA of Human Cancer Cells Drug Resistance

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To cite this article:

Alireza Heidari, Ricardo Gobato. "A Novel Approach to Reduce Toxicities and to Improve Bioavailabilities of DNA/RNA of Human Cancer Cells–Containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–trans–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as Anti–Cancer Nano Drugs by Coassembly of Dual Anti–Cancer Nano Drugs to Inhibit DNA/RNA of Human Cancer Cells Drug Resistance", *Parana Journal of Science and Education*, v. 4, n. 6, **2018**, pp. 1-17.

Received: July 25, 2018; **Accepted**: July 29, 2018; **Published**: August 9, 2018.

Abstract

The aim of the present study was to reduce toxicities and to improve bioavailabilities of DNA/RNA of human cancer cells–containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as anti–cancer Nano drugs by coassembly of dual anti–cancer Nano drugs to inhibit DNA/RNA of human cancer cells drug resistance.

Keywords: Toxicities, Bioavailabilities, DNA/RNA, Human Cancer Cells, Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet), Zidovudine (ZDV) [Azidothymidine (AZT)], Anti–Cancer Nano Drugs, Drug Resistance.

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1. Introduction

The aim of the present research was to reduce toxicities and to improve bioavailabilities of DNA/RNA of human cancer cells–containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] (Figure 1) as anti–cancer Nano drugs by coassembly of dual anti–cancer Nano drugs to inhibit DNA/RNA of human cancer cells drug resistance [1–176]. Results have shown that unclacined catalyst and calcined catalyst have high activity for hydrogenolysis reaction. The effect of calcination on activity and selectivity was investigated and revealed that uncalcined catalysts with high percent of Cadmium Oxide (CdO) showed higher activity than calcined catalysts with the same composition, whereas uncalcined catalysts with high percent of Iron(III) Oxide (Fe_2O_3), Iridium(IV) Oxide (IrO_2), Rhodium(III) Oxide (Rh_2O_3), Ruthenium(IV) Oxide (RuO_2) and Titanium Dioxide (TiO_2) showed lower activity than calcined catalysts with the same composition [1–176]. The results showed that using catalyst with high percent Iron(III) Oxide (Fe_2O_3), Iridium(IV) Oxide (IrO_2), Rhodium(III) Oxide (Rh_2O_3), Ruthenium(IV) Oxide (RuO_2) and Titanium Dioxide (TiO_2) the single hydrogenolysis occurs mostly; and the Cadmium Oxide (CdO) catalyst had more tendencies to the multiple hydrogenolysis [1–198, 201].

2. Materials, Research Methods and Experimental Techniques

Energy Dispersive X–Ray Analysis (EDXA), Energy Dispersive X–Ray Microanalysis (EDXMA), Scanning Electron Microscope (SEM), Brunauer–Emmett–Teller (BET) analysis, X–Ray Diffraction (XRD), Transmission Electron Microscope (TEM), Differential Thermal Analysis–Thermal Gravim Analysis (DTA–TGA), Energy–Dispersive X–Ray Spectroscopy (EDX), ^{1}HNMR, ^{13}CNMR, UV–Vis, HR–Mass, Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR–FTIR) and FT–Raman spectroscopies characterized the reduction of toxicities and to improve bioavailabilities of DNA/RNA of human cancer cells–containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as anti–cancer Nano drugs by coassembly of dual anti–cancer Nano drugs to inhibit DNA/RNA of human cancer cells drug resistance provides interesting redox properties for liquid–phase oxidation of Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] under moderate reaction conditions using Hydrogen Peroxide (H_2O_2) as oxidant and Acetonitrile Anhydrous, 99.8% as solvent [199, 200].

3. Results and Discussion

Catalysis is the art of lowering the activation energy of a chemical transformation. Catalysis has numerous applications and practical consequences: almost every process in nature and chemical industry uses some kind of catalysis. Multicomponent Reactions (MCR) is highly convergent reactions where a final product is formed in one chemical step (one–pot) by more than two starting materials. Typical examples include the Hantzsch Dihydropyridine (Pyridine) synthesis, the Passerini– or Ugi reaction. Catalysis and Multicomponent Reactions (MCR) have several important aspects in common including reduction of time, effort and cost for synthetic processes. In this work, a short overview on commercial bioactive nanocompounds or nanocompounds to reduce toxicities and to improve bioavailabilities of DNA/RNA of human cancer cells–containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as anti–cancer Nano drugs by coassembly of dual anti–cancer Nano

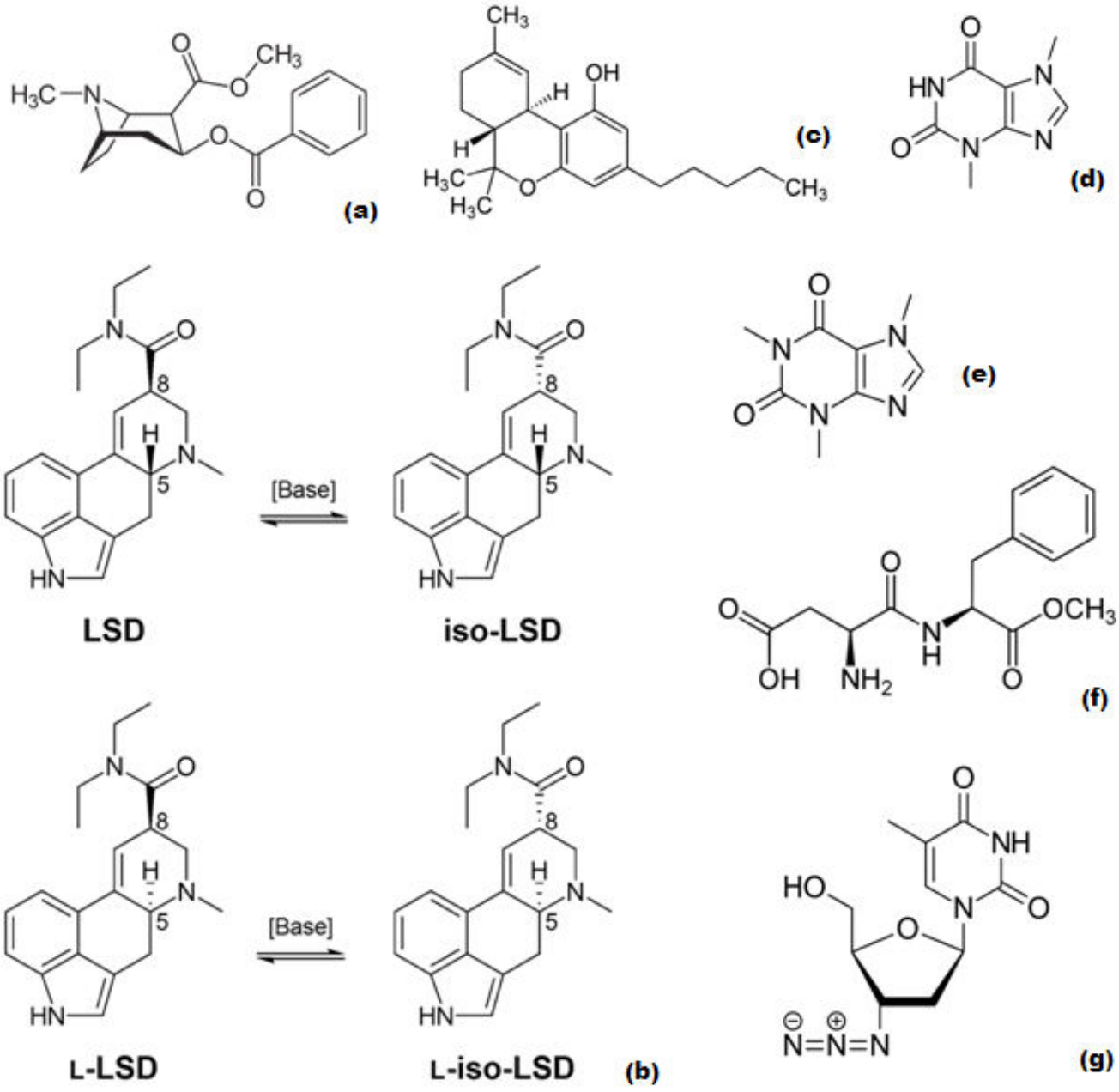

Figure 1: Molecular structure of (a) Cocaine (Coke), (b) Lysergide (Lysergic Acid Diethyl Amide or LSD), (c) Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], (d) Theobromine (Xantheose), (e) Caffeine, (f) Aspartame (APM) (NutraSweet) and (g) Zidovudine (ZDV) [Azidothymidine (AZT)] nanoparticles [1–198, 201].

drugs to inhibit DNA/RNA of human cancer cells drug resistance by MCR chemistry is given together with some recent results from the BioSpectroscopy Core Research Laboratory at Faculty of Chemistry, California South University (CSU), Irvine, California, USA.

The results showed that using catalyst with high percent Iron(III) Oxide (Fe_2O_3), Iridium(IV) Oxide (IrO_2), Rhodium(III) Oxide (Rh_2O_3), Ruthenium(IV) Oxide (RuO_2) and Titanium Dioxide (TiO_2) the single hydrogenolysis occurs mostly; and the Cadmium Oxide (CdO) catalyst had more tendencies to the multiple hydrogenolysis.

4. Conclusion

A series of Iron(III) Oxide (Fe_2O_3), Iridium(IV) Oxide (IrO_2), Rhodium(III) Oxide (Rh_2O_3), Ruthenium(IV) Oxide (RuO_2) and Titanium Dioxide (TiO_2) were synthesized via a post–treatment procedure and characterized using Energy Dispersive X–Ray Analysis (EDXA), Energy Dispersive X–Ray Microanalysis (EDXMA), Scanning Electron Microscope (SEM), Brunauer–Emmett–Teller (BET) analysis, X–Ray Diffraction (XRD), Transmission Electron Microscope (TEM), Differential Thermal Analysis–Thermal Gravim Analysis (DTA–TGA), Energy–Dispersive X–Ray Spectroscopy (EDX), ^{1}HNMR, ^{13}CNMR, UV–Vis, HR–Mass, Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR–FTIR) and FT–Raman spectroscopies. The reduction of toxicities and to improve bioavailabilities of DNA/RNA of human cancer cells–containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as anti–cancer Nano drugs by coassembly of dual anti–cancer Nano drugs to inhibit DNA/RNA of human cancer cells drug resistance provides interesting redox properties for liquid–phase oxidation of Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9–Tetrahydrocannabinol (THC) [(–)–*trans*–Δ^9–Tetrahydrocannabinol], Theobromine (Xantheose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] under moderate reaction conditions using Hydrogen Peroxide (H_2O_2) as oxidant and Acetonitrile Anhydrous, 99.8% as solvent. Under these conditions, the catalysts Cadmium Oxide (CdO) showed good substrate conversion and excellent product selectivity. The use of stronger oxidizing agent, Iron(III) Oxide (Fe_2O_3), Iridium(IV) Oxide (IrO_2), Rhodium(III) Oxide (Rh_2O_3), Ruthenium(IV) Oxide (RuO_2) and Titanium Dioxide (TiO_2), resulted in the formation of only iso–LSD, L–LSD and L–iso–LSD, Figure 1(b).

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