

**Record 1 of 8**

Title: Carbonic anhydrase inhibitory properties of phenolic sulfonamides derived from dopamine related compounds

Author(s): Gocer, H (Gocer, Hulya); Akincioglu, A (Akincioglu, Akin); Goksu, S (Goksu, Suleyman); Gulcin, I (Gulcin, Ilhami)

Source: ARABIAN JOURNAL OF CHEMISTRY **Volume:** 10 **Issue:** 3 **Pages:** 398-402 **DOI:** 10.1016/j.arabjc.2014.08.005 **Published:** MAR 2017

Abstract: The effects of some phenolic sulfonamides were determined on the cytosolic carbonic anhydrase isoenzyme I and II (hCA I and II). Both isoenzymes were purified separately from human erythrocytes, using the Sepharose-4B-L-tyrosine-sulfanilamide affinity column chromatography method. In continuation of the study, we identified the inhibitory effects of phenolic sulfonamides 1-4 on the esterase activity of hCA I, and II. The inhibitory effects of phenolic sulfonamides 1-4 were tested on human carbonic anhydrase isoenzymes hCA I, and II. Among the compounds 14, compound 1 was concluded to show the best inhibitory effects. According to our data, IC50 values of compound 1 were found as 3.55 and 2.94 μ M for hCA I, and hCA II, respectively. On the other hand, K-i values of this compound were found as 0.827 and 0.745 μ M for both isoenzymes, respectively. (C) 2014 King Saud University. Production and hosting by Elsevier B.V.

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Author Identifiers:

Author	ResearcherID Number	ORCID Number
Gulcin, ilhami	F-1428-2014	0000-0001-5993-1668

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Record 2 of 8

Title: Synephrine and phenylephrine act as -amylase, -glycosidase, acetylcholinesterase, butyrylcholinesterase, and carbonic anhydrase enzymes inhibitors

Author(s): Taslimi, P (Taslimi, Parham); Akincioglu, H (Akincioglu, Hulya); Gulcin, I (Gulcin, Ilhami)

Source: JOURNAL OF BIOCHEMICAL AND MOLECULAR TOXICOLOGY **Volume:** 31 **Issue:** 11 **Article Number:** e21973 **DOI:** 10.1002/jbt.21973 **Published:** NOV 2017

Abstract: In this paper, synephrine and phenylephrine compounds showed excellent inhibitory effects against human carbonic anhydrase (hCA) isoforms I and II, -amylase, -glycosidase, acetylcholinesterase (AChE), and butyrylcholinesterase (BChE). Synephrine and phenylephrine had K-i values of 199.02 +/- 16.01 and 65.01 +/- 5.00M against hCA I and 336.02 +/- 74.01 and 92.04 +/- 18.03M against hCA II, respectively. On the other hand, their K-i values were found to be 169.10 +/- 80.03 and 88.03 +/- 5.01nM against AChE and 177.06 +/- 6.01 and 78.03 +/- 3.05nM against BChE, respectively. -Amylase and -glycosidase enzymes were easily inhibited by these compounds. -Glycosidase inhibitors, generally defined to as starch blockers, are anti-diabetic drugs that help to decrease post comestible blood glucose levels.

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Author Identifiers:

Author	ResearcherID Number	ORCID Number
Gulcin, ilhami	F-1428-2014	0000-0001-5993-1668

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Record 3 of 8

Title: The synthesis of novel sulfamides derived from beta-benzylphenethylamines as acetylcholinesterase, butyrylcholinesterase and carbonic anhydrase enzymes inhibitors

Author(s): Akincioglu, A (Akincioglu, Akin); Kocaman, E (Kocaman, Ebutalib); Akincioglu, H (Akincioglu, Hulya); Salmas, RE (Salmas, Ramin Ekhteiri); Durdagi, S (Durdagi, Serdar); Gulcin, I (Gulcin, Ilhami); Supuran, CT (Supuran, Claudiu T.); Goksu, S (Goksu, Suleyman)

Source: BIOORGANIC CHEMISTRY **Volume:** 74 **Pages:** 238-250 **DOI:** 10.1016/j.bioorg.2017.08.012 **Published:** OCT 2017

Abstract: In this study, a series of novel beta-benzylphenethylamines and their sulfamide derivatives were synthesized starting from (Z)-2,3-diphenylacrylonitriles. Pd-C catalysed hydrogenation of diphenylacrylonitriles, reduction of propanenitriles with LiAlH4 in the presence of AlCl3 followed by addition of conc. HCl afforded beta-benzylphenethylamine hydrochloride salts. The reactions of these amine hydrochloride salts with chlorosulfonyl isocyanate (CSI) in the presence of tert-BuOH and excess Et3N gave sulfamoylcarbamates. Removing of Boc group from the synthesized sulfamoylcarbamates with trifluoroacetic acid (TFA) yielded novel sulfamides in good yields. These novel sulfamides derived from beta-benzylphenethylamines were effective inhibitors of the cytosolic carbonic anhydrase I and II isoenzymes (hCA I and II), acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) with K-i values in the range of 0.278-2.260 nM for hCA I, 0.187-1.478 nM for hCA II, 0.127-2.452 nM for AChE and 0.494-1.790 nM for BChE. The inhibitory effects of the synthesized novel sulfamides derived from beta-benzylphenethylamines were compared to those of acetazolamide and dorzolamide as clinical hCA I and II isoenzymes inhibitors and tacrine as a clinical AChE and BChE enzymes inhibitors. In addition to in vitro tests, molecular modeling approaches are implemented not only for prediction of the binding affinities of the compounds but also to study their inhibition mechanisms in atomic level at the catalytic domains. (C) 2017 Elsevier Inc. All rights reserved.

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Author Identifiers:

Author	ResearcherID Number	ORCID Number
Salmas, Ramin Ekhteiri	J-6401-2016	0000-0003-3888-5070
Gulcin, ilhami	F-1428-2014	0000-0001-5993-1668

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Record 4 of 8

Title: INVESTIGATION OF INHIBITORY EFFECT OF HUMIC ACID ON ACETYLCHOLINESTERASE AND BUTYRYLCHOLINESTERASE ENZYMES

Author(s): Akincioglu, H (Akincioglu, Hulya); Gulcin, I (Gulcin, Ilhami); Alwasel, SH (Alwasel, Saleh H.)

Source: FRESENIUS ENVIRONMENTAL BULLETIN **Volume:** 26 **Issue:** 6 **Pages:** 3733-3739 **Published:** 2017

Abstract: Humic acid is a principal component of humic substances, which is the major organic constituents of soil, coal, peat, many upland streams,

dystrophic lakes, and ocean water. It is produced by the biodegradation of dead organic matters. Humic substances contain major groups for chemistry, such as polyphenols, polycarboxylic acids, carbonyl groups, and peroxides. The presence of carboxylate and phenolate groups gives the humic acids the ability to form complexes with ions such as, Fe²⁺, Fe³⁺, Mg²⁺, and Ca²⁺.

Acetylcholinesterase (AChE, E.C.3.1.1.7), also known as AChE, is a hydrolase that hydrolyses the neurotransmitter acetylcholine. AChE is found at mainly neuromuscular junctions and cholinergic brain synapses, where its activity serves to terminate synaptic transmission. Reduction in the activity of the cholinergic neurons is a well-known property of Alzheimer's disease. Acetylcholinesterase inhibitors are employed to reduce the rate at which acetylcholine (ACh) is broken down, so that increasing the concentration of ACh in the brain and fighting the loss of ACh caused by the death of cholinergic neurons. Natural compounds are very important for Alzheimer's disease. Humic substances are the major natural bio-polyelectrolyte and contain major groups for chemistry.

In this study, the effect of humic acid was investigated on acetylcholinesterase (AChE) and butyrylcholinesterase (BChE, E.C.3.1.1.8) enzymes. AChE and BChE inhibition studies were performed according to Ellman method. IC₅₀ and K_i values were calculated for humic acid. These values were found 0.474 and 0.181 nM for AChE and 20.83 and 0.208 nM for BChE, respectively. The inhibition type was determined as competitive.

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Author Identifiers:

Author	ResearcherID Number	ORCID Number
Gulcin, İlhami	F-1428-2014	0000-0001-5993-1668

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Record 5 of 8

Title: Synthesis and characterization of ZnO:Ni thin films grown by spray-deposition

Author(s): Iskenderoglu, D (Iskenderoglu, Demet); Guney, H (Guney, Harun)

Source: CERAMICS INTERNATIONAL **Volume:** 43 **Issue:** 18 **Pages:** 16593-16599 **DOI:** 10.1016/j.ceramint.2017.09.047 **Published:** DEC 15 2017

Abstract: In the present study, nickel-doped zinc oxide thin films (ZnO:Ni) at different percentages (0-10%) were deposited on glass substrates by using a chemical spray technique. The effect of Ni concentration on the structural and optical properties of the ZnO:Ni thin films was investigated. The effect of Ni contents on the crystalline structure and optical properties of the films was systematically investigated by X-ray diffraction (XRD), scanning electronic microscopy (SEM), UV-vis, Photoluminescence spectra PL, and Raman spectrometry. The XRD analysis showed that both the undoped and Ni-doped ZnO films were crystallized in the hexagonal structure with a preferred orientation of the crystallites along the [002] direction perpendicular to the substrate. The XRD analysis also showed that the films were well crystallized in wurtzite phase with the crystallites preferentially oriented towards (002) direction parallel to the c-axis. SEM study reveals the surface of NiZnO to be made of nanocrystalline particles. The SEM images showed a relatively dense surface structure composed of crystallites in the spherical form whose average size decreases when the [Ni]/[Zn] ratio increases. The optical study showed that all the films were highly transparent. The band gap decreased up to the 7 at% Ni doping level, but the band gap increased after 10 at% Ni doping level. All thin films exhibited approximately 80% and above transmittance in the visible region. PL spectra of undoped and Ni-doped ZnO thin films showed some marked peaks at 376, 389, 494, and 515 nm. The obtained results revealed that the structures and optical properties of the films were greatly affected by doping levels. These films are useful as conducting layers in electro chromic and photovoltaic devices. Finally, all results were discussed in terms of the nickel doping concentration.

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Author Identifiers:

Author	ResearcherID Number	ORCID Number
GUNEY, Harun		0000-0001-9877-2591

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eISSN: 1873-3956

Record 6 of 8

Title: INFLUENCE OF ANNEALING AND OPTICAL AGING ON OPTICAL AND STRUCTURAL PROPERTIES OF ZnO THIN FILMS OBTAINED BY SILAR METHOD

Author(s): Duman, C (Duman, C.); Guney, H (Guney, H.)

Source: LITHUANIAN JOURNAL OF PHYSICS **Volume:** 57 **Issue:** 4 **Pages:** 218-224 **Published:** 2017

Abstract: In this study, zinc oxide (ZnO) thin films are deposited on fluorine doped tin oxide (FTO) substrates by using a successive ionic layer adsorption and reaction (SILAR) method. One of the samples is not annealed and others are annealed at 200, 400 and 600 degrees C, and all the samples are aged under ultraviolet (UV) light for 19 h.

These samples are used to investigate the effect of annealing and aging on the properties of ZnO. Structural properties of the ZnO thin films are examined with scanning electron microscopy (SEM) and X-ray diffraction (XRD). Photoluminescence, transmittance and absorption measurements are used to observe the optical properties of the films. In the literature, there is no study investigating the effect of aging on ZnO thin films deposited with the SILAR method, hence this study fills the gap in the literature.

Accession Number: WOS:000425253700004

Author Identifiers:

Author	ResearcherID Number	ORCID Number
GUNEY, Harun		0000-0001-9877-2591

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Record 7 of 8

Title: CaCO₃ and MgCO₃ Dissolving Halophilic Bacteria

Author(s): Orhan, F (Orhan, Furkan); Demirci, A (Demirci, Abdullah); Yanmis, D (Yanmis, Derya)

Source: GEOMICROBIOLOGY JOURNAL **Volume:** 34 **Issue:** 9 **Pages:** 804-810 **DOI:** 10.1080/01490451.2016.1273410 **Published:** 2017

Abstract: In the current study, fifteen halophilic and halotolerant bacteria were isolated from salt-affected soil of Sanlurfa, Turkey. The isolates were characterized by conventional and molecular techniques (16S rDNA sequence analyses) as belonging to seven different genus including Bacillus (5 isolates), Halobacillus (1 isolate), Oceanobacillus (2 isolates), Halomonas (3 isolate), Nesterenkonia (1 isolate), Chromohalobacter (2 isolates) and Jeotgalibacillus (2 isolates). According to the results obtained, the investigated bacterial strains have high salt tolerance and significant enzyme activities which can improve soil nutrient cycling and fertility. Furthermore, these bacterial strains have been investigated for their ability to dissolve common salts available in salt-affected soils. Salt dissolving experiments showed that two Chromohalobacter isolates were able to dissolve CaCO₃ and one of the Halomonas isolate was

able to dissolve both CaCO₃ and MgCO₃. As these bacterial isolates can dissolve CaCO₃ and MgCO₃, the availability of Ca²⁺ and Mg²⁺ ions may increase which can enhance the removal of the excess Na⁺ in soil profile.

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Record 8 of 8

Title: Determination of the Carbonate Dissolution Mechanism of *Lactococcus* sp.

Author(s): Yanmis, D (Yanmis, Derya); Orhan, F (Orhan, Furkan); Gulluce, M (Gulluce, Medine); Sahin, F (Sahin, Fikrettin)

Edited by: Akdemir AO; Ekinci A; Han I; Set E; Dadasoglu F; Karagoz K; Oztekin A

Source: INTERNATIONAL CONFERENCE ON ADVANCES IN NATURAL AND APPLIED SCIENCES (ICANAS 2017) **Book Series:** AIP Conference Proceedings **Volume:** 1833 **Article Number:** UNSP 020097 **DOI:** 10.1063/1.4981745 **Published:** 2017

Abstract: Magnesite, the main source for magnesium and magnesium derivatives, are also commonly used in the production of caustic, dead-burned and fused magnesia. World magnesite resources are estimated to be at 12 billion tonnes mostly located in China, Russia, North Korea, Australia and Turkey. Turkey is the second producer of the magnesite. Magnesite deposits in Turkey are sedimentary magnesite which have been formed in specific conditions as high concentrations of MgSO₄ and CO₂ and presence of certain organic salts or created by hot or cold dissolution connected with carbonate rocks mainly with dolomites. According to the genesis of magnesite deposits, they have some impurities as calcium, quartz, iron, etc. Impurities of magnesite, especially CaCO₃, reduce its economic value and industrial usability. In our previous study, we have performed biotechnologically enrichment of magnesite by *Lactococcus* sp., which gave significantly important results. However, we had no information about carbonate dissolution mechanism of bacteria. Therefore, it is aimed to reveal the metabolites of *Lactococcus* sp. and mechanism leading to the carbonate dissolution (MgCO₃ and CaCO₃).

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