

5- Formula

CUADERNOS DE CC. FÍSICO-QUÍMICAS Y MATEMÁTICAS

5, 1-290, 1999
ISSN: 1137-4411

Copying of the summary pages is authorised

Elejabarrieta, M^a Jesús; Santamaría, C. (Univ. del País Vasco. Dpto. de Física Aplicada II. Apdo. 644. 48080 Bilbao); **Ezcurra, A.** (Univ. Pública de Navarra. Dpto. de Física. Campus Arrosadía s/n. 31006 Iruñea): Estudio de la tapa armónica de la guitarra por el método de elementos finitos (Study of the harmonic plate of a guitar by means of the finite elements method) (Orig. es)

In: *Formula*. 5, 7-37

Abstract: In order to know the dynamic behaviour, and to optimise the construction techniques of the harmonic plate of a guitar, its vibrational properties have been simulated by means of the finite elements method. The results obtained with this method have been validated with experimental measurements of the modal parameters. A study is made of the behaviour of various materials used in the construction of the plate: cedar, pine and plywood, and the effects of two distributions of different ribbing have been analysed.

Key Words: Harmonic cover. Guitar. Modal analysis. Finite elements method. Response in frequency function. Vibration modes. Natural frequency. Admittance.

Elejalde Caravaca, Edurne (Univ. del País Vasco. Fac. de Ciencias. Dpto. de Química Orgánica. Apdo. 644. 48080 Bilbao): Aplicación de métodos espectroscópicos al estudio de las características cromáticas de los componentes polifenólicos presentes en vinos (Application of spectroscopic methods to the study of chromatic characteristics of polyphenolic components in wines) (Orig. es)

In: *Formula*. 5, 39-66

Abstract: The objective of this work is to study the most representative polyphenolic compounds present in Txakoli de Bizkaia wine to establish the relation with the chromatic characteristics. The determination of these phenolic compounds has been carried out using spectroscopic techniques and has been applied to white, rosé and red Txakoli wine samples of different varieties. Besides, the comparison of the methods and of the results that we have obtained has been developed. Therefore the study of the influence of the different varieties in the chromatic parameters and the tristimulus values has been carried out.

Key Words: "Txakoli" wine. Polyphenoles. Chromatic parameters.

Elejalde Caravaca, Edurne (Univ. del País Vasco. Fac. de Ciencias. Dpto. de Química Orgánica. Apdo. 644. 48080 Bilbao): Extracción y caracterización de antocianos y procianidinas de distintas variedades de uva empleadas en la elaboración del txakoli tinto de Bizkaia (Extraction and characterisation of anthocianins and procyanidins of various varieties of grapes employed in the elaboration of red "txakoli" wine in Bizkaia) (Orig. es)

In: *Formula*. 5, 67-82

Abstract: This study includes the extraction and the subsequent chromatographic and spectroscopic analysis of anthocianic and procyanidinic compounds present in red grapes of autochthonous varieties employed in the elaboration of the "Txakoli" wine in Bizkaia, and in grapes of a foreign variety. The extraction was carried out both on the husk and on the pips of the fruit, by means of the application of various techniques. The subsequent qualification was effected by perfecting a chromatographic method that allowed for the isolation of the anthocianic compounds extracted. Both the analysis and the subsequent identification of the compounds based on their spectral properties was accomplished by employing the HPLC-PDA coupled technique.

Key Words: "Txakoli" wine. Polyphenoles. Extraction.

Escobal González, Ana (Univ. del País Vasco. Fac. de Ciencias. Dpto. de Química Orgánica. Apdo. 644. 48080 Bilbao): Determinación estructural y cuantificación de componentes volátiles en muestras monovarietales de txakoli (Structural determination and quantification of volatile components in univarietal components of "txakoli" wine) (Orig. es)

In: *Formula*. 5, 83-108

Abstract: The objective of this work is the determination of the volatile compounds in Txakoli de Bizkaia wine. Majoritary and minority compounds have been studied. The wine samples were elaborated with one or two varieties. Different chromatographic methods and concentration methods have been developed. One of the concentration methods has been chosen and applied to the determination of the volatile minority compounds that permit the application of the gas chromatographic technique. Because of the results, we can say that the content in minority compounds is the typical of a young wine for the same type of varieties.

Key Words: Chromatography. Mass-gases. "Txakoli" wine. Volatiles. Monovarietals.

Ibarra, Andoni (Euskal Herriko Unib. – CSIC. Zientziaren Filosofia Unitatea. 1249 Posta Kutxa 20080 Donostia): Errepresentazioaren teoria orokor batentzako ekarpen -xume- bat (A -modest- contribution for a general theory of representation) (Orig. eu)

In: *Formula*. 5, 109-127

Abstract: The starting point of this article can be summarised with the following slogan: "knowledge is representation". However, it is not clear what is understood by "representation". After analysing the different characterisations of the representation in various areas of science, philosophy and common language, the appropriate conditions for a commendable representation concept are explicated. Different possible strategies for a general concept of representation are analysed and, finally, the author presents a possible plural concept of representation within the framework of a general theory of representation.

Key Words: Representation. Structure. Model. Data. Theoretical constructions. Invariability. Covariability.

Marín Martínez, Angel; González Sotos, León (Univ. Pública de Navarra. Dpto. de Automática y Computación. Campus Arrosadía. 31006 Iruñea): Modelos deductivos para datos borrosos (Deductive models for fuzzy data) (Orig. es)

In: *Formula*. 5, 129-159

Abstract: This work aims to present an approach to different data models for managing uncertain information. Basic concepts about database relational model and the interpretation of the uncertainty, suggested by the fuzzy logic, are introduced in order to get it. In the study of cases we emphasize the question of the information redundancy and the deduction and querying methods for every model.

Key Words: Relational model. Fuzzy logic. Prolog.

Sarasua, Jose Ramon (Euskal Herriko Unib. Industria eta Telekomunikazio Ingeniarien Goi Eskola Teknikoa Meatze eta Metalurgi Ingeniaritza eta Materialen Zientziaren Saila. Urkijo zumardia, z/g 48013 Bilbo): Beira eta karbono-zuntzez sendotutako polimeroen erreologia egoera solidoan (Solid state rheology of polymers reinforced by glass and carbon fibers) (Orig. eu)

In: *Formula*. 5, 161-196

Abstract: According to the requirements of materials science research, the physical and mechanical properties of four composite systems have been investigated in relation to their microstructure. Upon the different nature of the components and their compositional ratios, the main microstructural variables of these materials have been investigated: degree of crystallinity in the matrix, fiber length distributions and orientation, and the fiber-matrix interphase adhesion. The mechanical properties of these materials have been used into a theoretical model with composition and microstructure as variables. The good agreement found between experimental and calculated results proves the validity of the predicting model.

Key Words: Polymer composites. Physical and mechanical properties.

Ugalde, Jesus M.; Mercero, José M.; Fowler, Joseph E.; Elorza, José M. (Euskal Herriko Unib. Kimika Fak. 1072 Posta Kutxa. 20080 Donostia): Aluminioaren Toxizitatea I. Aluminio (III) Katioa eta Azido Aspartiko Aminoazidoaren Arteko Elkarrekintzak (Toxicity of aluminium I. Interactions between the aluminium cation (III) and the aspartic aminoacid) (Orig. Eu)

In: *Formula*. 5, 197-209

Abstract: We have performed an Ab-Initio study to elucidate the bio-toxicity of aluminum (III) cation. We have employed the Density Functional Theory methodology to calculate the interactions between the aluminum (III) cation and an aminoacid residue. To reduce the problem to its basics, we have chosen aspartic acid, and investigated its smallest functional moiety, i.e., the carboxylate anion. Additionally we have introduced a methyl group to perform a more accurate representation of the aspartic acid aminoacid chain. We have compared this data with a non-toxic metal cation, e.g. magnesium (II).

Key Words: Aluminium. Magnesium. Aspartic acid. Toxicity. Metals. Aminoacids. Ab-Initio. Interactions.

Martín Martín, Jesús (Univ. de Salamanca. Area Física Teórica. Plaza de la Merced, s/n. 37008 Salamanca): La ingravidez de Einstein y el alumbramiento de otro Marconi (Einstein's weightlessness and the birth of another Marconi) (Orig. es)

In: *Formula*. 5, 213-226

Abstract: Einstein's Theory on Gravitation foresees that a gravitational field can be propagated in space at the speed of light, as is also the case with electromagnetic waves. Now nobody doubts this forecast, as its effects on the movement of some double stars have been observed. The intention of this conference is to analyse this fascinating story, and to divulge the scientific efforts accomplished to demonstrate the existence of such gravitational waves.

Key Words: General Relativity. Gravitational waves. Relativist theories.

Castellet, Manuel (Eusko Ikaskuntza. Miramar Jauregia - Miraconcha, 48. 20007 Donostia): Métodos algebraicos en geometría. De Sócrates a la Ingeniería genética (Algebraic methods in geometry. From Socrates to genetic engineering) (Orig. es)

In: *Formula*. 5, 227-236

Abstract: The study of the properties of bodies which are not altered by continuous deformations is the objective of algebraic topology. Starting from an imaginary Socratic dialogue, the author introduces concepts of the theories of homology and homotopy that allow us to differentiate the surface of a sphere from that of a bull. The author finally introduces the technique of location in order to obtain properties from a space as from those of its localised spaces in each prime number.

Key Words: Algebraic topology. Homology. Homotopy. Location.

Torre Boronat, M. Carmen de la (Univ. de Barcelona. Dept. de Nutrició i Bromatologia. Fac. de Farmàcia. Av. Joan XXIII s/n. 08028 Barcelona): Bases científicas que sustentan el valor nutricional y de salud del consumo moderado de vino (Scientific bases that sustain the nutritional and health value of a moderate consumption of wine) (Orig. es)

In: *Formula*. 5, 237-248

Abstract: This work recalls the role of wine in nutrition. Arguments are offered according to which, wine, without forgetting the fact it is an alcoholic beverage, must follow certain criteria of moderate consumption. Such arguments can, however, explain with greater reliability some of the beneficial effects for the health that are attributed to wine. There is no doubt, that research in human beings would bring up more serious arguments than the encouraging conclusions found by epidemiological studies which are, nowadays, the only solid factual information available.

Key Words: Wine and health. Anti-oxidants. Wine.

García Olmedo, Francisco (Univ. Politécnica de Madrid. E.T.S. Ingenieros Agrónomos. 28040 Madrid): La tercera revolución verde (The third green revolution) (Orig. es)

In: *Formula*. 5, 249-255

Abstract: The third green revolution is in its beginnings and it is based on the application of genetic engineering to the improvement of cultivated plants. Its scientific cornerstone is molecular genetics, which developed as from the discovery of the DNA structure by Watson and Crick in 1952. The author sketches a complete panorama of evolution and improvement of cultivated plants from the neolithic period to the present day, and this revolution is situated in a general context.

Key Words: Genetic engineering. Plant improvement. Plants. Transgenic food.

Sánchez, José Luis (Univ. Autónoma de Madrid. Dpto. de Física Teórica. Cantoblanco, s/n. 28049 Madrid): Física Cuántica: Avanzada (y pesadilla) del conocimiento científico actual (Quantum Physics: Advances (and nightmares) of current scientific knowledge) (Orig. es)

In: *Formula*. 5, 259-261

Abstract: The evolution of the quantum theory is analysed from the conceptual point of view, emphasising the interpretative problems thereof, particularly as refers to the concept of physical reality, that in the quantic theory presents some radically different facets from those in "classic" physics.

Key Words: Quantum Mechanics. Physical Reality. Non - separativity.

Ortiz, Eduardo L. (Harvard Univ. Dpto. de Historia. Cambridge, MA 02138. Estados Unidos): Lenguajes, mecanismos y geometría: El Ensayo de Lanz y Betancourt, de 1808, sobre la composición de máquinas (Languages, mechanisms and geometry: the 1808 Essay of Lanz and Betancourt on the composition of machines) (Orig. es)

In: *Formula*. 5, 263-274

Abstract: In this work it is considered to show how machines, understood as mechanical auxiliaries invented by man to simplify his tasks, became, after a long process initiated at the beginning of the past century, objects of scientific consideration and as such, how they generated new ideas. A crucial stage in that process was covered by the mathematician José María de Lanz, who was born in Mexico, in a family that originated in the Basque Country.

Key Words: Machines. Languages. Cinematics.

Mijangos, Carmen (Instituto de Ciencia y Tecnología de Polímeros (CSIC). Juan de la Cierva, 3. 28006 Madrid): La investigación en materiales polímeros. Una necesidad de la sociedad (The investigation in polymeric materials. A need of society) (Orig. es)

In: *Formula*. 5, 275-280

Abstract: Polymers are materials which have become indispensable in the modern world of medicine, sport, in the automotive industry, in agriculture, in construction and in many other activities. Development in this field over the last 50 years has been spectacular for two reasons. Firstly, there is an ever improving understanding on how the structure of such materials is related to their properties and secondly, new synthetic methods are constantly being developed in order to make ever more complex structures that are better adapted to specific applications.

Key Words: Polymers. Design. Synthesis. Characterisation. Properties. Applications.

Rial, Eduardo (Centro de Investigaciones Biológicas (CSIC). Velázquez 144. 28006 Madrid): Las UCPs: una nueva vía para el tratamiento de la obesidad (The UCPs: a new route for the treatment of obesity) (Orig. es)

In: *Formula*. 5, 281-284

Abstract: Recent advances in the knowledge of the mechanisms that control corporal weight are to lead us to the development of new therapies for the treatment of obesity. In this article a description is made of how the discovery of UCP2 and UCP3, two uncoupling proteins that produce a reduction in energetic efficiency in the mitochondrial breathing, may lead us to the design of medicines that directly stimulate the burning of the excess of calories provided by the diet.

Key Words: Obesity. Mitochondria. Uncoupling Protein. Breathing.