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PREFACE

This new book presents original research results on the leading edge of chemistry research. Each article has been carefully selected in an attempt to present substantial research results across a broad spectrum. Topics discussed include the molecular cluster ensembles in biomatrices and the influence of ETIs; sulfur compounds as antioxidants; ensembles of molecular clusters in water HCl; applications of DSMO in organic semiconductor fields; influence of water-dimethyl sulfoxide medium on complex-forming properties of crown ether 18-crown-6; growth and characterization of antimony nanostructures on inert layer-material substrates; adsorption of gaseous Hg0 and HgCL2 with innovative composite suflurized activated carbons; sulfur compounds significance in fossil fuels and their impact on the environment; and catalysis using oxovanadium complexes of 4-acylpyrazolone ligand.

Chapter 1 – Molecular cluster ensembles in biomatrices of plants and living organisms are analyzed where the main properties of the ensembles are described. Further, the structures of water clusters, clusters in polysaccharides and proteins are given. The dynamics of the molecular cluster distribution in biomatrices under the influence of energy fields from the Earth and space is investigated for: laurel leave, potatoes, wheat grain, eggs, casein, myosin, collagen, chitin, garden snails and agarose hydrogel. The directed impact of ETIs (extraterrestrial intelligences) on the Earth biosphere and the risks connected with it are discussed. To communicate with each other and to influence the other, ETIs apply their perfect knowledge about molecular clusters in biomatrices and properties of water in hydro spheres. It is shown, how our biosphere shall be influenced directly by the Kepler-30 Empire through water cluster ensembles in our hydrosphere and the human biomatrix *in vivo* (as a third communication channel). Here new risks are not known to us. Mankind is suggested to be a project of ETIs.

Chapter 2 – Small-molecules containing sulfur can ameliorate oxidative damage, acting as effective antioxidants, and playing a crucial role on health. In this chapter, the authors discuss the antioxidant activities of organosulfur compounds, highlighting the different role of the three main families of natural compounds containing sulfur: glucosinolates, sulfur amino acids and disulfides. Glucosinolates are present in vegetables included in the cruciferous family such as broccoli, Brussels sprouts and cauliflower. Consumption of these vegetables has been associated to lower incidences of many diseases including cancer and cardiovascular disorders. Glucosinolates are transformed into isothiocyanates such as sulforaphane or phenethyl isothiocyanate which inhibit carcinogenesis through unique mechanisms of cancer inhibition. Sulfur amino acids include cysteine and cysteine derivatives such as glutathione, a tripeptide with an important antioxidant role in preventing damage to cellular components caused by reactive oxygen species. *N*-Acetylcysteine is extensively used as a mucolytic agent, and it is a precursor of taurine. Taurine exhibits numerous beneficial actions such as improvement of cardiovascular health and lowering of blood pressure. Vegetables of the genus *Allium* such as garlic and onions have shown potential chemopreventive properties, which have been attributed to the presence of high levels of organosulfur compounds such as diallyl disulfide. This disulfide has shown anti-proliferative effects against different types of cancer cells. Lipoic acid, a naturally occurring cyclic disulfide derived from octanoic acid, has been related to the prevention of age-related cognitive dysfunction and progression of Alzheimer's disease.

Chapter 3 – The long-range order (LRO) in water solutions of hydrochloric acid (11.7; 2.9; 0.6; 0.3; 0.03 mol/l) and water was investigated at 286 K and under atmospheric pressure from 101867 to 104133 N/m^2 by using the gravitational mass spectroscopy (GMS). All liquids were observed to be nano disperse emulsions containing molecular clusters e. g. $(H_2O)_{11\pm1}$, $(HCl\cdot 98H_2O)_1$. The dynamics of the development of a super cluster structure (associates of large clusters) in solutions will be given in dependence on the HCl concentration. $(HCl\cdot 98H_2O)_1$ being the base cluster in solutions and on whose surface a bimolecular water layer is built was modeled. The layer is working as a membrane with whose help the cluster communicates with the surroundings; its surface tension was found. The base water cluster $(H_2O)_{11\pm1}$ in its expanded form is integrated in LRO of solutions where it is up to 0.001 mol/l HCl recessive. Inside of $(HCl\cdot 98H_2O)_1$, the ion pair $H_3O^+Cl^-$ as core is stabilizing the oscillation of this cluster. The integral cluster distribution in solutions was given. The dependence of the cluster mass on the oscillation frequency and sequence number in the ensemble shall be described by Zubow equations. LRO of solutions is sensitive to atmospheric pressure and earthquake shock waves.

Chapter 4 – Dimethyl sulfoxide (DMSO), usually known as "universal solvent", in addition to its regular applications in synthetic and analytical chemistry, physical chemistry, biology, medicine, cosmetic, etc., it has found manifold uses in many other fields, for example, in electronics, but mostly still as cleaning agents for integrated circuits and electronic components. However, scientific interests and commercial applications of DMSO in electronics were not just for these. In this character, a less common but very promising application of DMSO in the field of organic semiconductor, or rather conducting polymer, is presented. Generally, the effects of DMSO (liquid or vapor) on the properties of various of conducting polymers, especially commercial poly(3,4-ethylenedioxythiophene): poly(styrenesulfonic acid) (PEDOT:PSS), by different treatment methods, and corresponding mechanisms and applications were described. It must be pointed out that DMSO has an important impact on PEDOT:PSS films to improve their morphology, electrical conductivity, thermoelectricity, work function, interfacial contact between different layers in devices, and mechanical performance, etc., and thus DMSO-modified conducting polymers have been applied to many fields, including optoelectronic devices, sensors, thermoelectric materials, antistatic coatings and so on. Moreover, possible challenges and prospects in these fields were also stated. In view of the rapid development of organic semiconductor industry, DMSO will undoubtedly find its important and incomparable status in the future applications.

Chapter 5 – The water-dimethylsulfoxide (H_2O-DMSO) medium influence on the thermodynamic of "host-guest" molecular complex formation reactions is the topic of this chapter. The interest for the study of biological model reactions in water-DMSO solvent is due to the use of DMSO as a high-power solvating agent in the design of many new chemical and pharmaceutical processes. The interactions between the amino acids glycine (Gly), D,L-alanine (Ala), L-phenylalanine (Phe) and the small peptide glycyl-glycyl-glycine (3Gly) with crown ether 18-crown-6 (18C6) have been recently studied. The experimental part of the research has been carried out at T = 298.15 K by means of the TAM III calorimetric titration system (TA Instruments, USA) and TAM Thermometric MOD 2277 (Sweden). The model L+M $\leftrightarrow$ [LM] fits well to all studied reactions, where L is amino acids or 3Gly and M is 18C6. The content of DMSO in H_2O-DMSO solvent has not exceed 0.4 mole fraction of DMSO mixtures, due to the low solubility of amino acids and 3Gly in H_2O-DMSO solvent at high DMSO contents. The authors have found that the increase of DMSO concentration in mixtures in general brings about an increase of the stability of the complexes and of the exothermicity of the complexation reactions, indicating the strong influence of this component on the reaction of complex formation. The thermodynamic parameters of complex formation (Gibbs energy, enthalpy and entropy) and of the solvation of reagents have been discussed and the solvation contribution into the complex stability and energy of interactions has been evaluated. The analysis of the enthalpic characteristics of reactions and of reagent solvation has revealed that the changes in the [LM] complex formation enthalpy in H_2O-DMSO solvent mostly depend on the changes in the enthalpy of solvation of 18C6. This fact supports the conclusion that the macrocycle plays the prevailing role in the formation of the solvation shell of [LM] in H_2O-DMSO, as the authors also found in water-ethanol and in water-acetone mixed solvents. Moreover, the enthalpic solvation characteristics of 18C6 have been successful used for estimating the reaction enthalpy changes for the transfer from water to H_2O-DMSO solvents. It was assumed that the established correlation between enthalpy changes in the solvation state of 18C6 and enthalpies of reaction may be applied to estimate the enthalpy changes of interaction between 18C6 and amino acids and small peptides in H_2O-DMSO mixtures with high DMSO contents, where the experimental determination of the enthalpy characteristics of complexation is hampered by the low solubility of amino acids and small peptides.

Chapter 6 – With the aid of sophisticated growth techniques, a wide variety of nanostructured materials have become fabricated with high control over their size, dimensionality and lattice type. By large, the physical properties of such nanomaterials are quite different from their normal bulk counterparts, therefore providing a plethora of applications in various solid state devices. Antimony (Sb) based nanostructures have drawn special attention recently. Bulk Sb crystallizes in the rhombohedral structure with its ground state being semi-metallic in nature. Material properties in reduced dimensions are strongly modified due to quantum confinement and surface effects in general. Furthermore, nanostructural Sb could become topological insulators because the non-trivial bulk band order supporting topologically protected surface states. Thus, in requisite is the choice of synthesizing techniques capable of controlled growth. In this limelight, this chapter is devoted to understanding the self-assembly mechanism of Sb nanostructures from initial nucleation stage to final texture transformation. To nullify the influence of substrates on the Sb nanomaterials grown, the authors use inert layer-material substrates such as highly-oriented pyrolytic graphite (HOPG) and molybdenum disulphide (MoS_2). These growth systems serve as models for the self-assembly of nearly free-standing nanostructures. Furthermore, the surface properties of these inert substrates are quite similar to their single- and few-atomic-layer counterparts. These ultrathin materials have drawn tremendous interests for applications in two-dimensional (2D) electronic devices. Nanostructure growth on HOPG and MoS_2 therefore also serve as models for understanding contact and interface formations on those 2D electronic materials. The growth of Sb nanostructures on HOPG and MoS_2 in ultra-high vacuum is monitored via *in situ* scanning tunneling microscopy (STM). 3D islands, 2D thin films and 1D nanorods of Sb are obtained on these substrates with different flux and temperatures. The formations of different types of Sb nanostructures are explained in terms of diffusion and dissociation of Sb_4 clusters generated from a thermal evaporator. The lattice parameters of these 3D and 2D Sb structures on HOPG are close to the bulk values. The Sb nanorods often form bundles with 90° intersection. Atomic resolution STM images revealed a simple cubic lattice structure in the 90° elbow area of Sb nanorods whereas rhombohedral Sb(110) lattice was obtained away from the intersection, indicating an allotropic modification at nanoscale. In addition, the pre-deposited Sb on graphite shows remarkable effect on the nucleation and growth of Ge and Al nanostructures. A significant increase in the Ge cluster island density and pinning of Al islands on HOPG terraces have been observed in the presence of Sb. These observations offer material design strategies via altering the dimensionality and size with possible extension to mass production of electronic, thermoelectric, magnetic and spintronic nano-devices.

Chapter 7 – The impacts to the environment and public health resulted by the occurrence of various anthropogenic contaminants, notably those containing mercury, have been the issues of great importance to ensure the environmental sustainability. Given the lowest boiling point among metallic elements, Hg is a volatile metal and commonly exists in the gas phase such as flue gases emitted from combustion sources, producing threats to the receiving environment and public health by potentially less restricted gas-phase transport and transfer. Therefore, mercury-containing compounds in the atmosphere are recognized as hazardous air pollutants (HAPs) that present high risks to the environment and human health, and are currently regulated by the United States Environmental Protection Agency (USEPA) and recommended by the United Nations Environment Programme (UNEP). Mercury is typically present in the environment in three forms including elemental mercury (Hg^0), oxidized mercury (Hg^{2+}), and gaseous mercury. Amongst these, Hg^0 and its derivates have raised additional international concerns given their characteristics of strong toxicity, long-range transport potential due to their persistence and bioaccumability in various biotas. The elemental Hg and the oxidized Hg approximately account for 50% of total Hg in the flue gas emitted from coal-fired power plants, respectively (5:5), whereas the molar ratio of the elemental Hg to the oxidized Hg in the flue gas emitted from municipal solid waste incinerators (MSWIs) is about 6:4. In comparison to other heavy metals, mercury has unique physicochemical characteristics with low melting point of -39°C, low boiling point of 356°C, high vapor pressure of 0.246 Pa at 25°C, and low water solubility of 6.0×10^{-5} g/L H_2O at 20°C. Combustion is one of the major sources emitting mercury into the environment. Mercury is emitted mainly in the form of Hg^0 during the combustion processes at high temperatures (up to 1,427°C), followed by a homogeneous oxidation forming $HgCl_2$ during post combustion ranging from 204°C to 354°C. As the temperature of stack gas drops to 125~325°C, the oxidized Hg species (e.g., $HgCl_2$, HgO, and $HgSO_4$) are formed by heterogenous catalytic oxidation. Therefore, Hg mostly reacts with Cl_2, HCl, and O_2 in the stack gas, and seldomly reacts with other species (e.g., NH_3, N_2O, and H_2S). It is worth noting that HgO can react with H_2SO_4 and SO_2 to form $HgSO_4$ and Hg^0 at high and low flue gas temperatures (e.g., 300°C and 40°C), respectively, interfering the removal of Hg^0 by many mercury treatment technologies. As powdered activated carbon (PAC) has been widely used for mercury adsorption, its efficiency can be further enhanced by sulfur impregnation. Two innovative composite PACs impregnated with sulfur species, vapor-phase elemental sulfur (S^0) and aqueous-phase sodium sulfide (Na_2S), in different sequences have been developed for investigating the efficient removal of gaseous elemental mercury (Hg^0) or mercury chloride ($HgCl_2$) with respect to the adsorptive capacities and adsorption rates at various influent Hg^0 or $HgCl_2$ concentrations and different adsorption temperatures. The effects of sulfur impregnation on the physicochemical characteristics of the PACs before and after impregnation, including specific surface area, pore size distribution, and sulfur content, were also examined. In the results, the PACs impregnated with aqueous Na_2S, followed by the subsequent gaseous Hg^0 impregnation exhibited higher adsorptive capacities of both mercury species. At elevated adsorption temperatures (200 and 300°C), the adsorption of Hg^0 onto the surface of the composite sulfur-impregnated PACs is more effective, whereas the composite PACs provided elevated adsorptive capacities for $HgCl_2$ at a lower temperature (150°C), suggesting possible variation of mercury control strategies under different circumstances. These findings provide insight into the application of this innovative composite sulfur impregnated PACs for the removal of gaseous Hg^0 and/or $HgCl_2$. Higher adsorptive capacities of Hg^0 and/or $HgCl_2$ compared to those of previous studies were achieved by using the innovative composite sulfur-impregnated activated carbons.

Chapter 8 – Nature is abundant with many sulfur compounds. In all fossil fuels (natural gas, coal and crude oil) sulfur is present in diverse forms. Sulfur compounds are responsible for the odor of the fossil fuels. Using upstream processes, fossil fuels are separated into natural gas, coal and crude oil and it also removes the odor. Sulfuric compounds must be removed before commercial utilization of fossil fuels to make it odorless. In the past, sulfur compounds were kept intentionally in fuels during petroleum refining as it helped to improve lubricity of the diesel engine. It was noticed that due to the burning of fossil fuels in the diesel engine, gases like Sulfur Dioxide (SO_2) and other greenhouse gases polluted the environment. Nitrogen oxide (NO_2) which is an air pollutant was also responsible for this cause. The volatile organic compounds and heavy metals were generated in the exhaust vents of automobile which were released into the atmosphere which resulted in environmental pollution which is a major cause of acid rain. Sulfur compounds also have corrosive effects on refinery process equipments, piping and tanks. With this information, the current chapter will discuss the significance of sulphur compounds in fossil fuels and their impacts.

Chapter 9 – The interest in the coordination chemistry and catalytic activity of oxovanadium(IV) complexes of 4-acylpyrazolones has increased greatly in recent years. However, at the beginning of this time, only a minor amount of research was being done on catalysis using these complexes. This chapter includes discussion on the geometries and catalytic activities of the oxovanadium(IV) complexes of 4-acylpyrazolone. The single crystal XRD proven to be a powerful technique for the study of coordination geometry of oxovanadium(IV) complexes with 4-acylpyrazolone ligands. The single-crystal XRD analysis of the complexes reveals that the ligands coordinate with a vanadium atom to create an octahedral geometry and two *O, O*-chelating acylpyrazolonate ligands constitute two six-member rings with the vanadium. These complexes can exist in *syn*, *anti* and *twisted* coordination geometries. The catalytic activities of these complexes have been studied for the oxidation of styrene and benzylic alcohols. The complexes were immobilized over a solid support (ZrO_2/ SBA-15) and used as heterogeneous catalyst for the selective oxidation of styrene to benzaldehyde using H_2O_2 as an oxidant. The use of these complexes as homogeneous catalyst for the oxidation of styrene has also been reported. The oxidation of benzyl alcohol and a wide array of electronically diverse substituted benzyl alcohols were carried out using these complexes as homogeneous catalysts with H_2O_2. The results elucidate that the oxovanadium(IV) complexes of 4-acylpyrazolone ligands are efficient heterogeneous as well as homogeneous catalysts for the selective oxidation of styrene and benzylic alcohols to their corresponding benzaldehydes.

CONTENTS

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Chapter 1

MOLECULAR CLUSTER ENSEMBLES IN BIOMATRICES AND THE INFLUENCE OF ETIS: A NEW APPROACH TO THE PROPAGATION OF LIFE IN SPACE – RISKS

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ABSTRACT

Molecular cluster ensembles in biomatrices of plants and living organisms are analyzed where the main properties of the ensembles are described. Further, the structures of water clusters, clusters in polysaccharides and proteins are given. The dynamics of the molecular cluster distribution in biomatrices under the influence of energy fields from the Earth and space is investigated for: laurel leave, potatoes, wheat grain, eggs, casein, myosin, collagen, chitin, garden snails and agarose hydrogel. The directed impact of ETIs (extraterrestrial intelligences) on the Earth biosphere and the risks connected with it are discussed. To communicate with each other and to influence the other, ETIs apply their perfect knowledge about molecular clusters in biomatrices and properties of water in hydro spheres. It is shown, how our biosphere shall be influenced directly by the Kepler-30 Empire through water cluster ensembles in our hydrosphere and the human biomatrix *in vivo* (as a third communication channel). Here new risks are not known to us. Mankind is suggested to be a project of ETIs.

Keywords: Biomatrices, molecular clusters, water, casein, myosin, collagen, chitin, ETI, influence

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1. INTRODUCTION

Molecular clusters are formed under the influence of energy clusters of the physical vacuum [1, 2] which in turn should be understood as a concentration of atomic nuclei [3]. Molecular cluster ensembles and their super cluster structures of micelle type are involved in the gravitational interaction with each other [1, 4, 5] as well as in that one with celestial bodies [6]. These passive interactions proceed faster than light and they are used by extraterrestrial civilizations (ETIs) to communicate with each other in real time [1]. Thus, it is generally possible to influence directed molecular cluster ensembles through gravitational radiation and actively influence our biosphere. On the other side, polymorphic water structures are known to change physical, chemical processes of dissolution and formation of the long range order (LRO) in liquids [7]. It should be likely that the molecular cluster structures in biomatrices will be directed influenced by ETIs to stimulate or inhibit special chemical and biochemical reactions and thus to have an impact on mutagenesis, development of species and even on their behavior.

The aim of the present work is to summarize all data concerning molecular cluster ensembles in biomatrices and the celestial bodies' impact on them. Further, to understand the possibilities of the remote influence of ETIs on the biosphere of other planets as a way to expand the life in space.

First the state of water in biomatrices of plants and living organisms and in hydrogels, used as model biomatrices, shall be considered.

2. MATERIALS AND METHODS

As investigation objects served: wheat grain, starch, potatoes, agarose hydrogel, casein, the Garden slug (*Arion vulgaris*), the Large garden snail (*Helix pomatia*), eggs, collagen (ducks sinew and fish bubble), fish scales, duck heart and laurel leave. Wheat grain (type B from North Germany, Mecklenburg/Vorpommern) was collected from the lower ear part (Figure 12). The sensor of the Zubow gravitation mass spectrometer (GMS, earlier called as flicker noise spectroscopy [1]) was directly placed inside the grain to scan LRO in biomatrix according to the method described in [1]. Starch was gotten from 20 wheat ears. First the grains were ground in distilled water, then the suspension was squeezed out and the liquid part was taken for sedimentation where the precipitate of the second decantation was washed with distilled water. The obtained white powder was dried at 298 K on air and lastly over silica gel. The grain samples were collected from 20 random ears every second day (afternoon) on the very same agricultural area. LRO analysis was recorded not later than 15 minutes after sampling. The potato tubers were always taken from one and the same field (planted on 27.04.2006) and analyzed like above. Agarose hydrogel (97 wt. % water, model biomatrix [8, 9], http://en.wikipedia.org/wiki/Agarose_gel_electrophoresis) served also as gravitational sensor. Pure agarose of Aldrich (T_{gel} = 315K, T_{fl} = 533 K) was used for preparing the model biomatrix (0.3, 0.8 and 3 wt. %) for which it was dissolved in boiling distilled water ($(15 \pm 5)\cdot 10^{-8}$, $om^{-1}\cdot cm^{-1}$) with following cooling until room temperature [5]. Casein was made by a standard procedure of skimmed cow's milk (0.3 wt. % fat) at pH 4.6. The dry protein was defatted once more by extraction with hexane at 293 K, and after light grinding in a mortar (~ 0.1 mm) it was kept at this temperature until constant weight. A light pressed sample of the protein (α-casein, β-casein and χ-casein) was placed in the measuring cell of the GMS spectrometer and heated (6...10 K/min) up to 338 K, 373 K, 393 K, 433 K and 473 K. After reaching the desired temperature, the heating was turned off with following GMS recording. The Garden slug (*Arion vulgaris*) and Large garden snail (*Helix pomatia*) from North Germany (summer 2008) were chosen as examples for living organisms. For recording GMS the sensor just touched the surface of the body without disturbing the animals in their natural behavior. The GMS measurement of biomatrices was carried out during 30 s using two kinds of weak shock waves ($p < 1N/m^2$ and $p > 1N/m^2$). To analyze yolk and white of fresh hen eggs 10 pieces (June 2005) were chosen. Egg yolk and egg-white were separated from each other and measured with a scanning time of 30 s. Every measured signal was cleaned from gravitational noises, raised by proton dissolving/condensation in physical vacuum [10], and analyzed. The GMS sensor was installed directly in the egg tissue. The experiments were repeated three times. The measuring error was 10 ± 5 %, the temperature stability ± 0.1 K. While the cluster ensembles in collagen (air bubble), domestic duck heart and fish scales (roach) were investigated *in vitro* (washing with water and air-drying at 305 ± 5 K to constant weight) the garden snails were analyzed *in vivo*. The detailed measuring procedure of GMS was given in [1, 11, 12, 13]. The GMS equipment was placed in North Germany (53° 34′ 54″ N and 12° 47′ 02″ E). To find the correct position of celestial bodies the program ZET 9 (www.astrozet.net) was applied; to direct the GMS sensor to them - the slide plane of gravitational proton resonance (SPGPR, plane going through the Earth rotating axis and the sensor place on the Earth surface) [14]. The energy balance shift between the proton in the baryonic state and the dissolved one in the physical vacuum [3] is the platform for the gravitational radiation resonance registered by GMS.

3. RESULTS AND DISCUSSION

3.1. Ensembles of Molecular Clusters in Laurel Leaf Biomatrix

The application of GMS in botany opens interesting perspectives for the non-destructive analysis of plants, their research and classification. Below the authors showed for some simple examples the possibilities of the method.

Studying the ever-green laurel leaf (Figure 1) the already known pattern of the water cluster ensembles and the typical signal concentrations from sub micelle (interval ***C***) and micelle (interval ***D***) structures [11, 13, 15] were recorded.

Besides the signal concentrations in the intervals ***C*** and ***D*** the spectrum showed a group of signals whose number was much higher than in the intervals ***C*** and ***D***. They could be ascribed to structural elements of the laurel biomatrix. The presence of the intervals ***C***, ***D***, ***E***, ***F***, ***G*** and ***H*** in the leaf structure as well as in other ones, studied in the monograph [1], was an evidence for a common mechanism of the cluster formation in molecular matter that occurs in stationary waves of white gravitational noises. A new form of molecular matter in the plant biomatrix was therefore concluded.

The GMS spectrum of the same leaf at the same place after natural drying was shown in Figure 2.

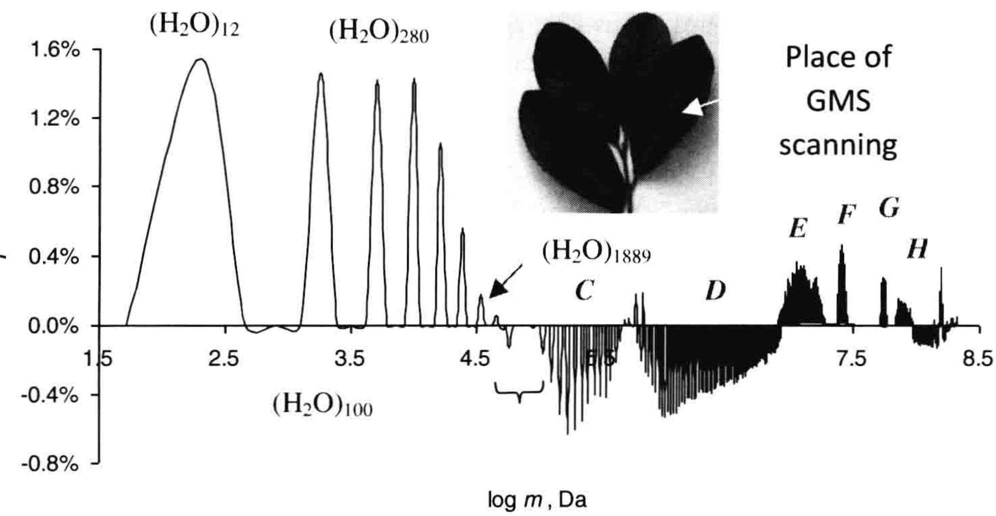

Figure 1. GMS spectrum of laurel leaf (13 November 2007), weak shock wave $p < 1 N/m^2$, Zubow constant is $6.4 \cdot 10^{-15}$ N/m, $N = 901$ (cluster kinds in the ensemble), $D_c = 46$ % (part of collapsed clusters) and $M_{GMS} = 43,201,325$ Da (average mass of all clusters).

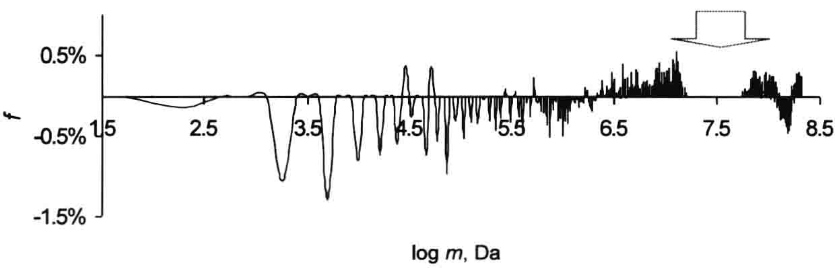

Figure 2. GMS spectrum of a dried evergreen laurel leaf (see Figure 1), $p < 1 N/m^2$, Zubow constant is equal to $6.4 \cdot 10^{-15}$ N/m, N = 708, $D_c = 42$ % and $M_{GMS} = 92,518,741$ Da.

As visible the drying process resulted in a LRO destruction in the mass range higher log *m* = 4.7. Here the number of oscillator kinds sharply decreased from 901 to 708 and the part of collapsed clusters reduced from 46 to 42 % while the average molecular mass of all clusters increased more than by two times from 43 million to 93 million Daltons (Da). In the oscillation of smaller mass concentrations, signals from collapsed clusters appeared, which were formed by the anhydrous skeletal biomatrix of the dry leaf. Between log *m* = 7.20 and log *m* = 7.79 there were not cluster signals (arrow) the same belongs to the range ***F*** (compare Figures 1 and 2!). The signal groups in ***G*** and ***H*** were highly destroyed however, on closer examination the main elements were detectable. Consequently, the LRO formation in biomatrix is connected not only with polysaccharides and salts but with water, too. In ***D*** and ***E***, strong destructions of micelles and their associates occurred though some groups of signals present in the freshly picked leaf remained. So principle it was possible to identify signals of organic clusters in leaf biomatrix. In the dry leaf, the most signals were consistent with those in the freshly chosen one (Figure 1). These results also showed that gravitational white noises directed form molecular clusters in biomatrices independently of the presence of water [1, 2]. In the dry leaf, there was no signal harmony in the range of sub micelles however, the signals permitted by white noises were present. To understand the dramatic increase in the average