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Measurement procedures for defining reference standard liquids for viscosity based on topoenergy principles.

"Metrology is the science of measurement and its application" [1]. In general practice of testing and measurements technical standards (ISO, ASTM, DIN, NF, etc.) are considered as compulsory guides while metrology is completely neglected. The right practice must consider metrology rules as compulsory, while technical standards are optional. Metrology has no substitute, so it can be considered by all people both by those performing and by users of measurements. Metrology gives the true value of all things including money.

Viscosity is a derived quantity whose metrology is actually based on water as unique primary standard [2]. This situation is far to be correct firstly because majority of Liquids Under Test (LUT) have viscosity values much different than water. Furthermore, measurement procedures substantiating above stated water viscosity [3, 4] were proved to be at least incorrect [5]. No one metrological laboratory was able up today to verify and/or to repeat these measurements according to a basic metrological principle.

In the latest 15 years a new metrological procedure based on Stokes law defining viscosity called as falling ball method was developed [6-8]. Unfortunately, this procedure has several major deficiencies. I have to mention only that in the long period of time the procedure was not finalized yet despite of big efforts.

Topoenergy (or topological) working principles were established by a long and intense experience with a wide category of measuring systems and transformation processes [9-13]. In particular these principles were applied to melt flow and solid deformation [12, 13, these communications are resumed in the present bulletin].

In the present note, these working principles are applied to three experiment types using the same experimental disposition of oscillating body immersed in a LUT as it was described previously [4]. Unfortunately, the reported therein values for water viscosity are unrealistic because the equations used were "created" with the only reason to reproduce the same value as the previous report [3].

Experimental disposition

Figure 1 schematically presents an application example of experimental disposition similar described previously [4]. High sensitive contactless encoders replace the classic optic system. In the first stage this disposition can be used for high viscous Newtonian LUT not necessary in vacuum and subsequently must be improved for higher accuracy. Figure 1 is very clear and does not need detailed explanations. However, the top motor applies a stepwise perturbation directly measured by pulse encoder in angular speed or rotation angle and the response is measured via calibrated torsion wire by the response encoder by rotation angle as a function of time.

Types of experiments

Figure 2 shows the three types of experiments:

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Experiment 1 consists in applying a rotation angle θP with an infinite angular speed ωP = ∞. The system reaction is damped oscillations of Immersion Body (IB) measured by the angle difference (θP – θR) as is shown in Figure 3. The attenuation coefficient "a" is a direct measure of Dynamic Viscosity (DV).

Experiment 2 consists in applying a constant angular speed ωP, so that the time dependence of (θP – θR) is shown in Figure 4, so that ωR→ ωP. The relationship between (θP – θR) and ωP is also related to DV.

Experiment 3 is subsequent relaxation experiment after experiment 2 for ωP = 0 (Figure 5). Experiments 2 and 3 were applied for capillary flow of polymer melts and tensile deformation of solid dumb bell test specimens [13].

Measurement principles

In view to convert the coefficients resulted in the above experiments in absolute units of DV, it is necessary to apply the Universal representation [9-13] for different sizes, shapes and surface nature of IB.

Table 1 shows the main features of the simplest four 3D shapes of IB as generated by rotation of 2D shapes: V = volume and A = area of 3D shape, Ao = area of 2D shape. All math relationships are expressed in Excel syntax.

Table 2 shows parameters V, A, Ao, V/A and Form Factor = A/Ao for the four basic 3D shapes considering 5 scaled up sizes. It is important to note that FF is constant and has specific value for each 3D shape. Figure 6 shows the dependence of the ratio (V/A) as a function of scaling coefficient. It is important to evidence the difference between considered 3D shapes. These measurement principles are not limited only to the above mentioned experiments.

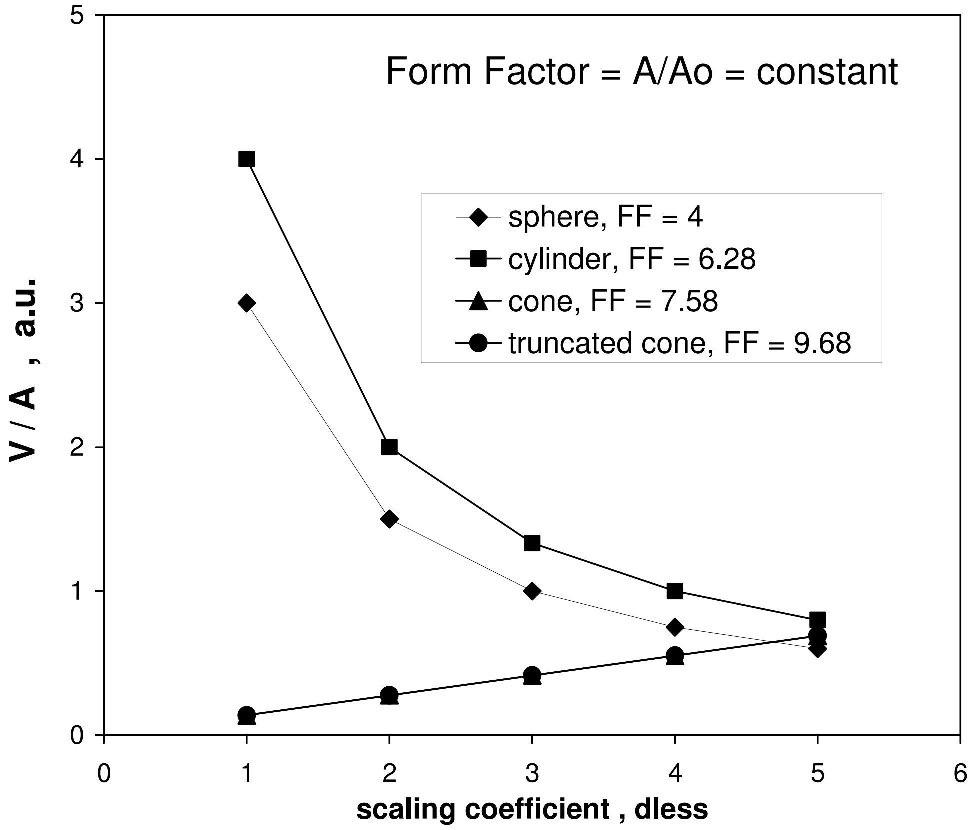

Figure 6.

Concluding remarks

1. Topoenergy principles significantly improve and simplify experiments defining the reference standards for viscosity.
2. Topoenergy principles allow defining more structural parameters of the LUT and the interfacial interaction between LUT and IB. It is well know that at this interface a separation process occurs both in the LUT and IB surface structures as a function of nature of LUT, IB surface, temperature, shearing, etc. Nature and amplitude of this interaction can be correlated to the proposed body layer thickness [5, 14].
3. In view to establish in accurate conditions viscosity of LUT by ontogenic and phylogenic Universal parameters it is necessary to consider series of IB of different 3D shapes, sizes, and their surface nature.

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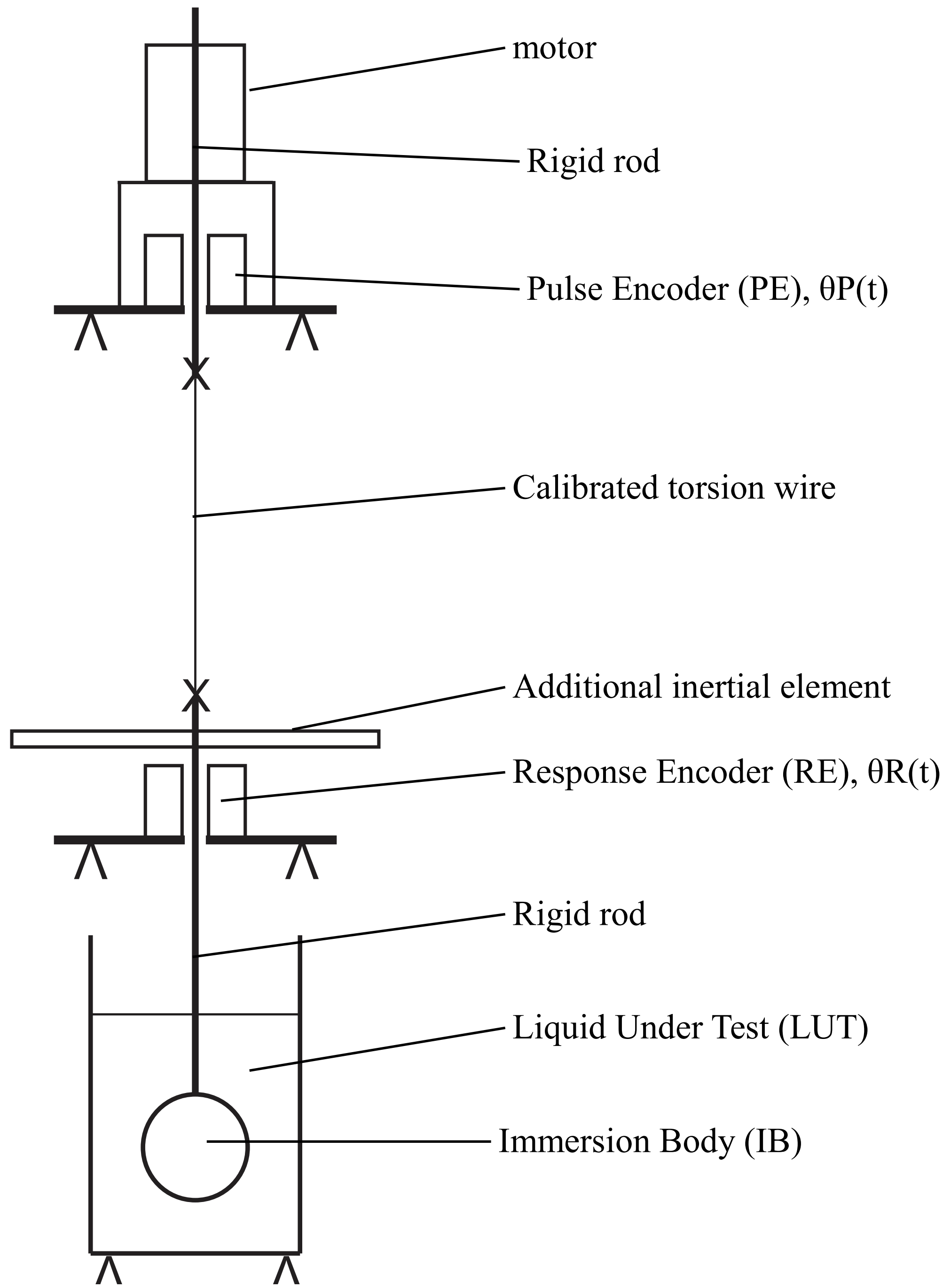


Figure 1. Schematics of proposed experimental disposition for defining standard liquids for viscosity. Sign "A" symbolizes the common support free of vibrations and other parasite movements.

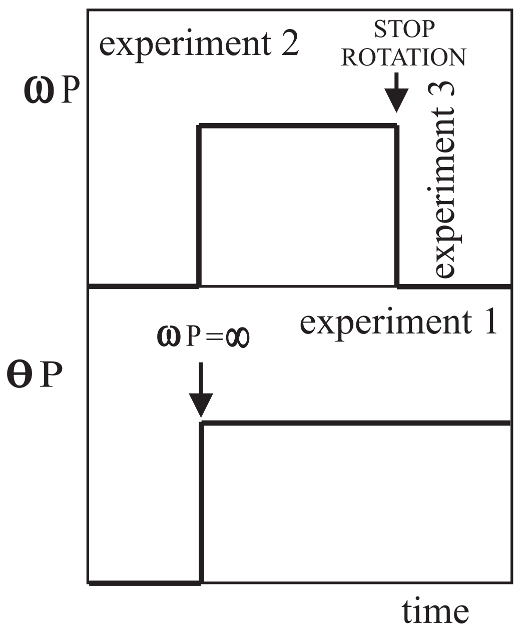


Figure 2.

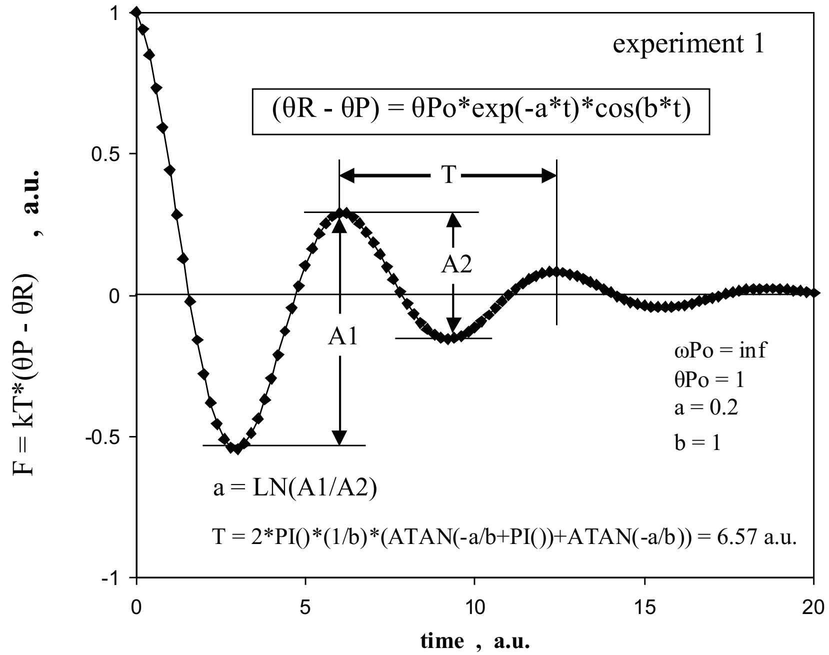


Figure 3.

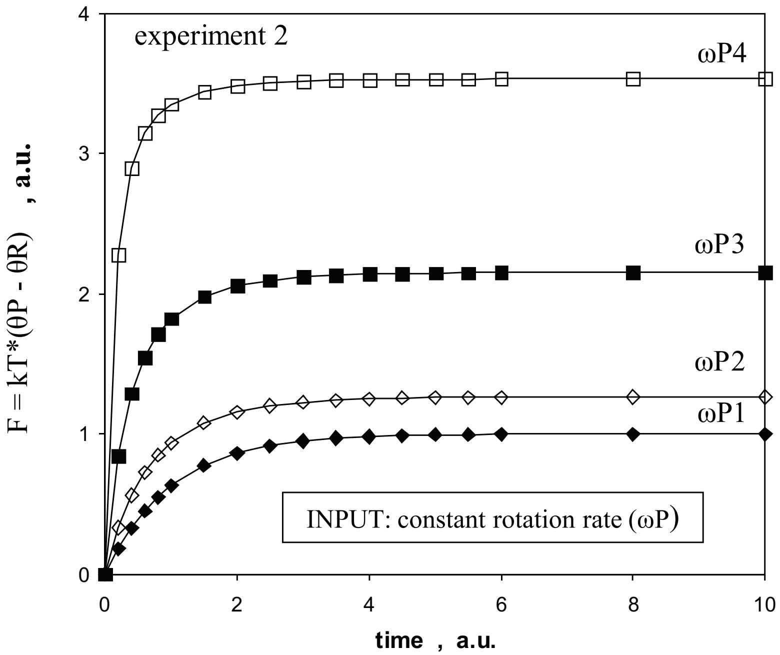


Figure 4.

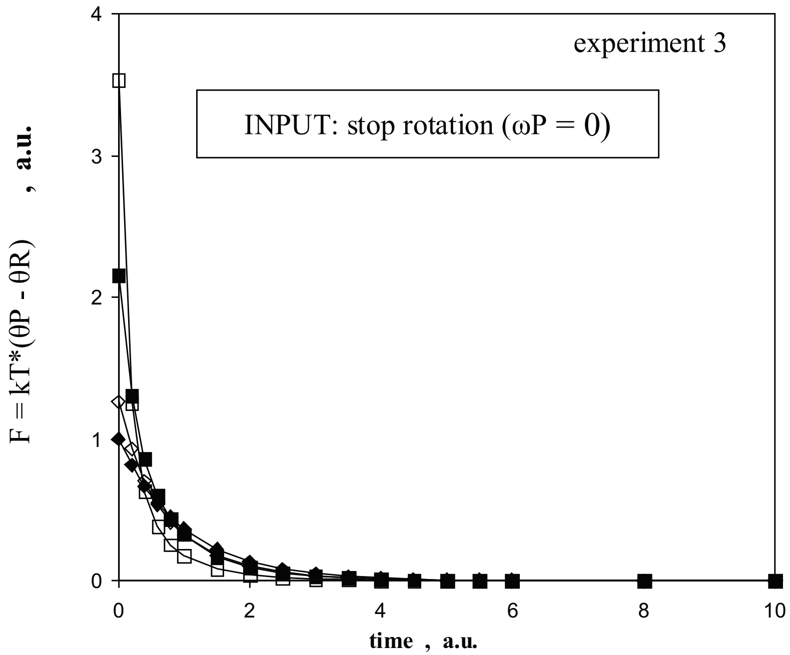
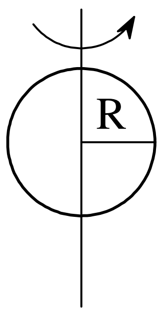
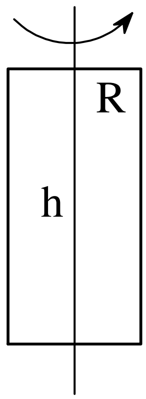
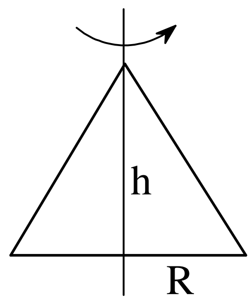
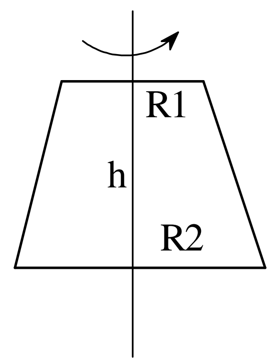


Figure 5.

Table 1. Basic 3D shapes for immersion body with rotational symmetry generated by 2D shapes.

sphere	cylinder	cone	Truncated cone
			

Immersion body	V=volume	Ao	2D-shape
sphere, R	(4/3)*PI()*R^3	PI()*R^2	circle
cylinder, R, h	PI()*R^2*h	2*R*h	rectangle
cone, R, h	(1/3)*PI()*R^2*h	R*h	triangle
truncated cone, R1, R2, h	(h/3)*(R1^2+R2^2+R1*R2)	h*(R1+R2)	trapezium

Immersion body	A=area
sphere, R	4*PI()*R^2
cylinder, R, h	2*PI()*(R^2+R*h)
cone, R, h	PI*R*((R^2+h^2)^0.5+R)
truncated cone, R1, R2, h	PI()* ((R2-R1)^2+h^2)^0.5)*(R1+R2)+PI()*(R1^2+R2^2)

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Table 2. Main features of 3D shapes scaled up by keeping as constant the Form Factor (FF = A/Ao); all dimensions in a.u.

sphere

R	1	2	3	4	5
A	12.57	50.27	113.10	201.06	314.16
V	4.19	33.51	113.10	268.08	523.60
V/A	3	1.5	1	0.75	0.6
Ao	3.14	12.57	28.27	50.27	78.54
A/Ao, dless	4	4	4	4	4

cylinder

R	1	2	3	4	5
h	1	2	3	4	5
A	12.57	50.27	113.10	201.06	314.16
V	3.14	25.13	84.82	201.06	392.70
V/A	4	2	1.33	1	0.8
Ao	2	8	18	32	50
A/Ao, dless	6.28	6.28	6.28	6.28	6.28

cone

R	1	2	3	4	5
h	1	2	3	4	5
A	7.58	30.34	68.26	121.35	189.61
V	1.05	8.38	28.27	67.02	130.90
V/A	0.14	0.28	0.41	0.55	0.69
Ao	1	4	9	16	25
A/Ao, dless	7.58	7.58	7.58	7.58	7.58

truncated cone

R1	1	2	3	4	5
R2	2	4	6	8	10
h	1	2	3	4	5
A	29.04	116.15	261.33	464.59	725.92
V	2.33	18.67	63.00	149.33	291.67
V/A	0.08	0.16	0.24	0.32	0.40
Ao	3	12	27	48	75
A/Ao, dless	9.68	9.68	9.68	9.68	9.68

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The VIII-th Intl. Congress on Rheology, 1-5 September 1980, Naples, Italy

TOPOLOGICAL ASPECTS OF FLOW AND DEFORMATION IN POLYMER COMPOSITES

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(Abstract)

The development of the introductory notions of topological thermodynamics has allowed the establishing of working principles in the modelling of energy circuits associated to composite systems. The starting point was the expressing of behaviour of crystalline-amorphous coupling in polyethylene in calorimetric systems followed by generalization of relations to thermally driven processes and at present by expressing the behaviour of a generalized measuring system. It is worth recalling the basic principles established so far, i.e.: (i) the composite nature of a system is emphasized by its behaviour as non-equilibrium system within an energy measuring system, and (ii) the transformation processes implied by such a system can be expressed in terms of time variation of energy flux or potential with respect to a temporar reference system.

The evaluation of behaviour on deformation and flow of composite systems is considered in this paper by the response function θ of energetic circuit for a steplike boundary condition, so that the general relation

$$\tilde{\theta} = \tilde{H}\,\tilde{U}$$

becomes

$$\theta(t) = \theta_o(1 + e^{-t/\tau})$$

hence

$$\tilde{H}(\tau) = 1/(1 + p\tau)$$

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$\tilde{H}$ is the distribution function of the relaxation periods which defines the topology of the circuit and thus the nature of the transformation process implied during flow or deformation; the upper sign denotes the Laplace transformation.

The two measuring systems allow estimation of period τ from conversion of resulted tension. For a set of experiments on identical samples yet with various deformation or flow rate, the behaviour of material is described by an invariable function H. Deformation experiments on polycarbonate specimens before and after yield limit shows two distinct materials, but for a wide range of deformation rates the relaxation periods reveal that the behaviour is unchanged for each one.

A careful reexamination of extensive experimental facts has shown that the major phenomenon which occurs in a composite material subjected to deformation or flow consists in a separation process characterized by a disclination state.

A similar process is found in extrusion flow system (by capillary rheometer) where overshoot or oscillatory phenomena induce in materials behaviour modifications. In conclusion the yield and extrudate fracture phenomena are considered to be a function both of internal energetic circuit (material morphology) and external energetic circuit (dissipative function), and these modifications are connected to a modification in disclination state in the material morphology.

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Proc. IX Intl. Congress on Rheology, Mexico, 1984.

UNIVERSAL REPRESENTATION OF FLOW BEHAVIOUR BASED ON TOPOENERGETIC PRINCIPLES

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ABSTRACT

The universal procedure recently established on the basis of topoenergetic principles concerning the univocal determination of composite (non-equilibrium) systems behaviour, are shortly reviewed and applied for two simple rheometric systems, namely, capillary flow and tensile test. The creation of Data Banks including ontogenic and phylogenic parameters describing individual and group behaviour, respectively, results as an immediate application in view of identifying and/or optimizing particular behaviours.

KEYWORDS

Topoenergetic theory of composite systems; universal procedure for system behaviour; capillary flow; tensile test; Data Banks.

UNIVERSAL TOPOENERGETIC PROCEDURE

Pure formal notions of topological thermodynamics were initially introduced in view of better describing non-equilibrium systems which involve different energy modes (Oster and Auslander, 1971a, 1971b; Auslander and others, 1972). The basic topoenergetic principle asserts that any kind of non-equilibrium system has a composite nature, so that for an overall transformation process at least two components mutually interact involving specific energy modes and revealed by an appropriate measuring system. Another working principle considers the equivalent energy circuit associated to the overall measuring system including the test specimen. Calorimetric systems were the first measuring systems studied according to these new principles (Drăgan, 1976, 1978a, 1979a), but by extending the new kinetic equations in Arrhenius representation to a large variety of thermal measuring systems, an universal procedure has been established (Drăgan,1979a,1979b,1980a,1982a,1983a,1983b). This practical procedure can be applied to any kind of measuring system and involves both some requirements of standard experimental conditions and a mathematical procedure of data processing. In the followings only a short presentation is included.

Let be a general measuring system driven by one potential U and $\Theta(t)$ is a response function measuring the response of the overall measuring system or a part of it to the externally applied perturbation $\Delta U = |U - U_o|$. The following affine relationship exists:

$$\ln \Theta = N \ln \Delta U + M \qquad (1)$$

in the following standard conditions: (i) Θ is a characteristic value (eigenvalue) from $\Theta(t)$ curve, identically defined for any ΔU value as stepwise perturbation; (ii) (N,M) parameters univocally define the individual behaviour (ontogeny) of the tested sample and are determined by linear regression of pairs of $(\Theta, \Delta U)$ values; (iii) $(\Theta, \Delta U)$ values are determined on identical test specimens by using the same measuring system; and (iv) each test specimen is maintained before the perturbation application at an equilibrium value over or below the threshold value U_o at which the studied process is inhibited or changes its nature.

For a simple transformation process $\Theta(t)$ may have one of the two shapes schematically drawn in Fig.1, where the most frequently used eigenvalues are graphically defined. They correspond to single (SMS) and differential (DMS) measuring systems (Dragan,1979a). For two eigenvalues Θ_1, Θ_2 of the same or different response fun-

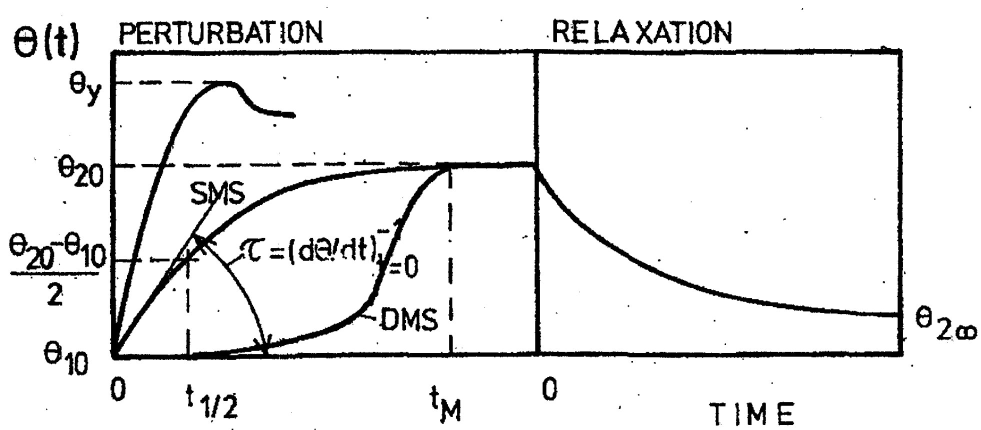

Fig. 1. Schematically drawn of typically time conversions of response functions.

ctions,but revealing the same nature of transformation process, another affine relationship exists in standard conditions:

$$\ln \Theta_1 = A \ln \Theta_2 + M \qquad (2)$$

as representing scaling relationship between the two eigenvalues. Taking into account Eq.(1) it results for the associated ontogenic parameters: $N_1 = AN_2$, and $M_1 = AM_2 + B$ (3).

For a series of composite systems tested in the same standard conditions and revealing the same process nature,a further affine relationship can be established: $N = nM + m$ (4),

where (n,m) parameters define the group behaviour or the <u>phylogeny</u> of the series.According to Eqs.(3) it results:

$$n_1 = n_2 \text{ , and } m_2 = n_1 B - Am_2 \qquad (5)$$

which represent the scaling relationships for phylogenic parameters.It is of practical importance to note that n is invariant.

Values of the inert (C_{in}) and the transforming (C_{tr}) components should satisfy a normalization equation in standard conditions. If we chose: $\Theta_1 \sim C_{in}$, and $\Theta_2 \sim C_{tr}$ (6),

Eq.(2) will represent exactly this normalization condition verified on standard composite systems.In these conditions always A<0 and (N_1,N_2) have opposite signs.Any eigenvalue may have one of the significances specified in (6),so that the process amplitude can be measured in units of C_{in} or C_{tr},and this means that the energy flow associated to the transformation process can be reported to one of their temporal reference frame (Drăgan,1978b,1979a).In other words,this energy flow may have two distinct directions or <u>polarities</u>,P,(Drăgan,1982b) determined by the algebraic signs of N and m,and has been standardized as in Table 1 by comparing a large number of transformation processes.

TABLE 1.Proposed standardization for process polarity.

Θ	(N,n)	P
C_{in}	same sign	-
	opposite signs	+
C_{tr}	same sign	+
	opposite signs	-

Ontogenic and phylogenic parameters also allow to determine the mass of the kinetic entity (c_{tr}) responsible for transformation and the specific compatibility or stability (CS or their opposite $\overline{CS}$) between C_{tr} and C_{in}. These two characteristics are evaluated in logarithmic scale by $-M/N$ and $-N^2/M$, respectively, and their algebraic signs depend on process polarity (Drăgan, 1983a).

CAPILLARY FLOW

Experimental. Model Instron 3211 with a capillary of Ø 0.05 in, L=2 in was used at successive speeds of plunger displacement of v_d=0.06;0.2;0.6;2;6;20 cm/min. Standard conditions for all measurements consist in the reservoir volume (10±0.5 cm^3), the prior thermostatation (20 minutes) and the recording of F(t) conversion both for flow and relaxation strictly by increasing of shear rates.

Results and discussion. Melt flow in capillary rheometer has been recently studied by considering $\Theta=t_M$ and $\Delta U=F_{20}-F_{10}$ for two series of high density polyethylenes (HDPE) and isotactic polypropylenes (iPP) both at 190°C (Drăgan, 1983c). Process polarity is positive ($t_M \sim C_{tr}$, N, n < 0) and two distinct phylogenies result. Process amplitude show a linear correlation with ln(crystallinity) as determined by DSC on quenched extrudates for v_d=2 cm/min. The crystallinity measured by melting enthalpy (ΔH_m) involves also effects of internal stresses accumulated by the amorphous-crystalline coupling (Drăgan, 1983a) better expressed by the ratio $\Delta H_m/h$ (h-height of melting endotherm). In Fig.2 the most significant ontogenic parameters are fitted as a function of $\ln(\Delta H_m/h)$. It results that: (i) amorphous phase is responsible for the revealed flow process while crystalline domains coexisting even in molten state act as inert component; and (ii) c_{tr} decreases with crystallinity (h) and with the amorphous-crystalline coupling. Phylogenic parameters of melt flow in the same standard conditions ($\Theta=\tau$, in s/N) for four series of polymers are fitted in Fig.3 (atactic polystyrene, aPS: Cristal grade at 170-220°C; atactic polycarbonate, aPC: Lexan 141 and 5 ICECHIM grades, at 250,260°C). m is proportional to the process extent and to $-\ln c_{tr}$ because $\tau \sim C_{tr}$, N < 0, but iPP, aPS and aPC are gathered in a "superphylogenic" group for which c_{tr} verify the well known relationship $c_{tr} \sim T_g$ (Drăgan, 1983a, 1983b).

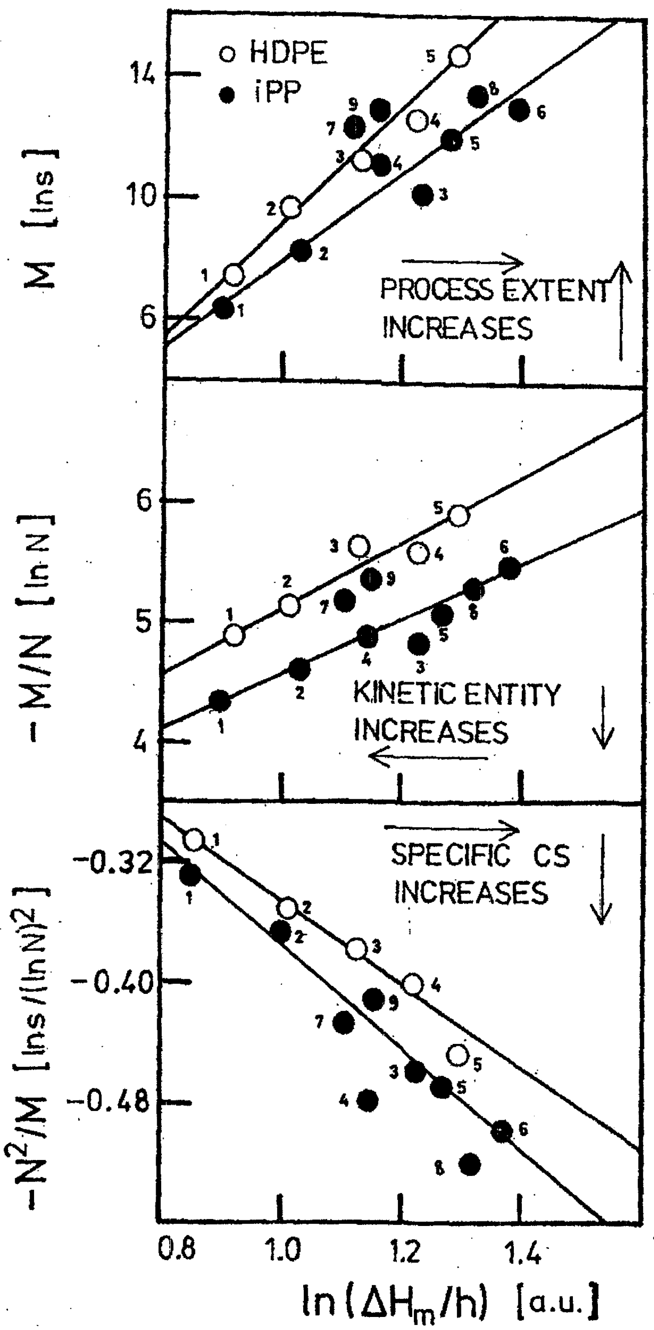

Fig. 2. Ontogenic parameters for melt flow in capillary rheometer for HDPE and iPP.

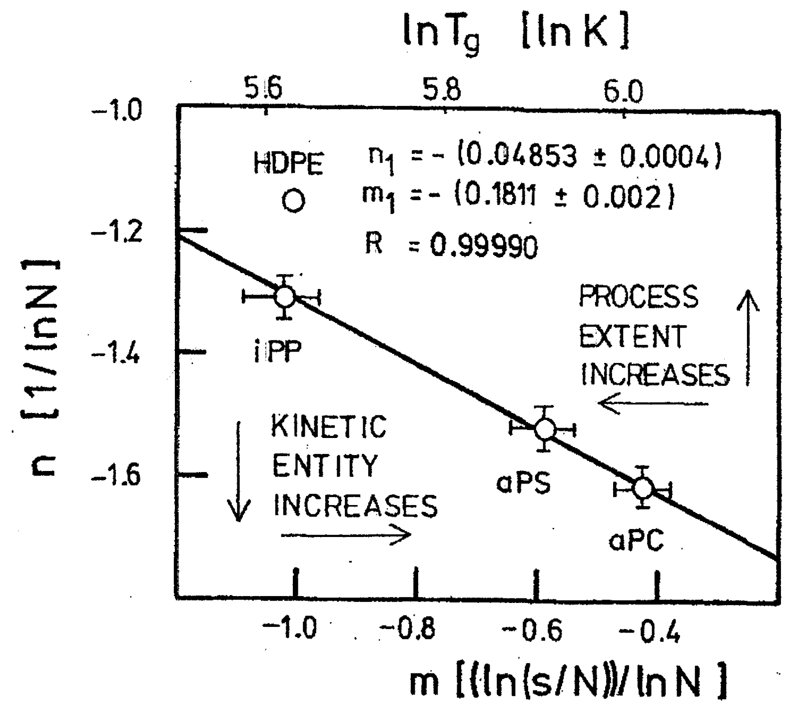

Fig. 3. Phylogenic correlation for capillary flow of several linear polymers.

TENSILE TEST

Mechanical behaviour of three polymer mixtures made of PE and chlorinated PE (CPE) are studied by considering F(t) conversions at five constant v_d (0.16 - 2.6 l/min).

Experimental.PE:HDPE Hizex 2200J and low density PE (LDPE) A 23 FB/035;CPE:HDPE chlorinated in suspension (CPEspn) and LDPE chlorinated in solution (CPEsoln),both with (37±1)% wt Cl.The three series (Fig.4) are performed by mill rolling (160°C,10 minutes) and compressed in rectangular sheets of 1mm thick.Dumb-bell type test specimen (ASTM D 638-72,type IV) obtained by punching was used.

Results and discussion.Tensile tests were performed at room temperature.The most significant ontogenic parameters obtained for $\Theta=t_M$,$\Delta U=v_d$ are represented in Fig.4 as a function of PE content. For HDPE based mixtures it results that:(i) amorphous phase is responsible for flow process;(ii) C_{tr} increases and c_{tr} decreases

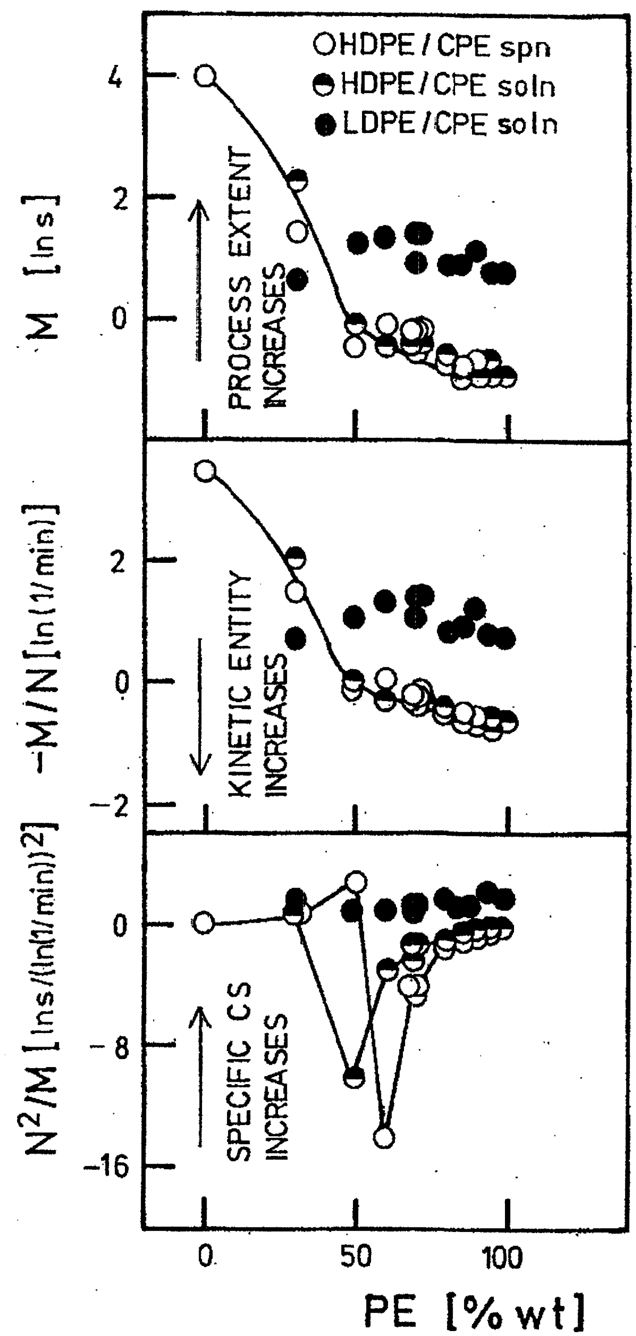

Fig. 4. Ontogenic parameters for flow process in tensile test of the three PE/CPE series.

with CPE content,drastically over 50%; and (iii) in this range of concentration CPE separates in conglomerates showing a minimum coupling strength with PE amorphous phase.LDPE based mixtures show an invariable behaviour with CPE content.

CONCLUSION

The above presented universal procedure and its newly introduced notions can be extended to any measuring system simulating synthesis and/or operation conditions,so that the creation of Data Banks including ontogenic and phylogenic parameters results in view of identifying and/or optimizing particular behaviours.

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Comments on "Universal representation of flow behavior based on topoenergetic principles", The IX-th International Congress on Rheology, 8-13 October 1984, Accapulco, Gro. Mexico, pp. 369-376."

The two series of experiments considered reveal the phase separation along flowing lines both in the melt and solid state. In the particular cases of considered samples the separation of crystalline phase from amorphous phase occurs.
The melt flow in capillary rheometer is shown in Figure 2 by ontogenic parameters as a function of LN(ΔHm/h). The ratio (h/ΔHm) is a measure of sharpness of DSC melting endotherm and also of the separation extent. By this reason the top graphic in Figure 2 must be corrected as M ~ − LN(Ctr). Coversely, ΔHm/h ~ CS as it is shown in the bottom graphic in Figure 2. Kinetic entity increases with the endotherm sharpness, i.e. with the size of crystalline domains. It results that by melt flow:

Ctr(iPP) > Ctr(HDPE); ctr(iPP) > ctr(HDPE); CS(iPP) > CS(HDPE).

Figure 3 shows that (iPP, aPS, aPC) are grouped in the same second phylogeny from which HDPE does not belong.
Figure 4 shows dependence of ontogenic parameters as a function of PE content for tensile tests at room temperature on PE/CPE blends obtained and tested in the same conditions. HDPE mixtures show similar behavior in respect to LDPE ones due by the crystalline content participating to the separation process. By this reason the top graphic must be corrected, so that process extent increases with HDPE content:
M ~ −LN(Ctr) and as in the case of melt flow the kinetic entity increases with crystalline size and separation extent. LDPE/CPEsoln blends appear to be perfect compatible without separation in the range of testing conditions applied.
In conclusion, the two series of transformation processes revealed have:

N*n1 < 0 it means positive process polarity (P +),
M ~ − LN(Ctr); − M/N ~ − LN(ctr); − (N^2)/M ~ − CS,

so that these are in good agreement with the latest significances of basic ontogenic parameters established for a large number of transformation processes revealed by different measuring systems:
Gh. Dragan, Structural and relativistic aspects in transforming systems. I. Arrhenius and Universal representations of thermally driven processes (see Table 4), GDF Databanks Bull., 15(2) (2011).

Author is deeply grateful to Professor Roger Tanner (The University of Sydney, School of Aerospace, Mechanical and Mechatronic Engineering roger.tanner@sydney.edu.au) for the copies on contributions from original proceedings of International Congresses on Rheology in 1980 (Italy) and 1984 (Mexico).

SCRISOARE DESCHISĂ către:
Biroul Român de Metrologie Legală
Institutul Naţional de Metrologie
Şoseaua Vitan Bârzeşti nr. 11, sector 4
Bucureşti 042 122

8 Noiembrie 2013

Stimate Doamne şi Stimaţi Domni,

De câteva luni încerc să vă contactez pentru a discuta o serie de probleme nerezolvate ale metrologiei actuale şi pentru care consider că am experienţă şi rezultate originale demne de a fi luate în seamă.
În primul rând trebuie să evidenţiez faptul că metrologia a devenit o activitate din ce în ce mai marginală în societate deşi ar trebui să fie o referinţă pentru toate celelalte domenii de activitate.Am întâlnit oameni de ştiinţă de talie mondială care nu ştiau de metrologie; şi nu au fost cazuri izolate. Semnificativ este faptul că vocabularul Word sub Windows® nu recunoaşte cuvântul „metrology".Vă ataşez o copie după posterul prezentat la ultimul congres de metrologie de la Paris.
Vă supun atenţiei următoarele două subiecte:

1. Viscozitatea nu are încă suport metrologic. Singurul etalon fundamental (apa) decretat de ISO/TR 3666-1998 se bazează pe două lucrări false care nu au fost verificate de nici un alt laborator.Se încearcă de peste 15 ani, cu intermitenţe, în două laboratoare (Japonia şi Franţa), a se pune la punct o procedură de definire a noi etaloane fundamentale de viscozitate bazată pe căderea liberă a unei bile. Am destule argumente să consider această metodă incorectă. Chiar bâlbâiala colectivelor care s-au succedat la definitivarea acesteia este un indiciu clar. Am încercat să iau legătura cu aceste laboratoare pentru a le propune colaborarea pe principii noi care simplifică mult experimentele şi ridică considerabil acurateţea măsurărilor, însă se pare că orgoliul profesional este încă insurmontabil în detrimentul progresului.
2. Temperatura este cred mărimea cea mai importantă în toate domeniile de activitate. Totuşi: (i) măsurările mele pe NTC-termistori au arătat că variaţia R(T) indică sistematic erori pe domeniul de temperatură cel mai folosit în practică; (ii) termometrele care folosesc drept sensori diode semiconductoare (în special monocristale de siliciu) au stabilitate, liniaritate şi sensibilitate mai bune decât termometrele etalon cu platină. Vă pot prezenta un echipament original de etalonare pe domeniul Tcamerei...+100 ^{0}C cu incertitudine de sub 0.01 ^{0}C. (iii) calibratoarele cu bloc solid din comerţ nu consideră gradienţii de temperatură la estimarea incertitudinii de măsură. Aceste argumente şi altele nemenţionate, conduc la necesitatea redefinirii termometriei şi a scării internaţionale de temperatură.

Gheorghe DRĂGAN, dr.fizician,

str. Abrud 25, Bucureşti, 011315
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Anexă 1 filă

TIME - AS UNIQUE BASE QUANTITY

Gheorghe DRAGAN, www.gdfdatabanks.ro
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This idea is based on long and intense experience and can open a new horizon in science and technology, but only with the help of METROLOGY. For this purpose it is essentially and necessary to keep it working properly first.

1. Viscosity measurement has no metrology support. None of metrology labs is able today to calibrate viscometers correctly.

HOWEVER:

1.1. PTB has issued ISO/TR 3666-1998 stating water as base standard for viscosity taking into account 2 works proved as fake. None metrology labs has established a procedure defining standard fluids for viscosity.

1.2. Accreditation organisms from different countries have accredited labs for measurement of viscosity, but in fact most of them do not measure viscosity (see NATA-Australia).

1.3.There are some famous companies selling standard fluids for viscosity without correct metrology base. For instance, Barry RADLEY (UK) and Nilay SHAH (US) as product managers from Brookfield head office and engineer labs did hear for first time about metrology at their technical presentation at 6th August 2010, Parramatta, Australia.

2.Estimation of the uncertainty of measurement is unknown for almost all people performing measurements, even metrologists. Furthermore, they do not take into consideration the basic rule that technical norms (ASTM, DIN, BS, etc.) are optional while metrology norms are compulsory.

3.Temperature is mostly used quantity in human activity, but there are some important unsolved metrology aspects:
(i) most of calibration procedures are not correct (see for instance dry well calibrators);
(ii) ITS-90 should be urgently corrected taking into account important progresses made in measurement techniques

THOSE MALFUNCTIONS CAN BE AVOIDED ONLY BY NEW ORGANIZING PRINCIPLES OF METROLOGY MAINLY BASED ON COMPULSORY PARTICIPATION OF ALL ORGANISMS WHOSE ACTIVITY IS BASED ON MEASUREMENTS

If someone is honestly interested about this new idea of
TIME AS UNIQUE BASE QUANTITY
I suggest to read first carefully the paper and to contact me for further details and to organize common experiments.

CONFIRMARE DE PRIMIRE

*Se completează de expeditor cu adresa sa pentru **înapoierea** confirmării*

Gheorghe DRAGAN
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Se completează de lucrătorul poștal

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BUCUREȘTI 8 — 11 11 13 22 — OF

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ISSN 1453 - 1674

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Last name	Dragan
Born	1 September 1945, Ploiesti, Prahova (Romania)
Studies	Faculty of Physics, University of Bucharest, Romania (1963-1968) Ph.D.in Physics, University of Bucharest, Romania (1980)
experience	● Head of material testing laboratory, ICECHIM, Polymer Department, Bucharest (1969-1979); ● Initiator and leader of the research project on new forms and sources of energy; ICECHIM, Center of Physical Chemistry (1979-1988); ● Head of laboratory of analytical devices and measuring instruments, AMCO-SA, Bucharest (1988-1993); ● Technical manager of GDF-DATA BANKS, Bucharest (1993-2008); ● Expert metrologist, Romanian Bureau of Legal Metrology, Bucharest, Romania (1997-2000).
publications	● >100 scientific papers ● >70 scientific communications ● 17 patents ● 5 books
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Previous issues of GDF DATABANKS BULLETIN

Year	VOL	NO	Content (titles)	$*)
1997	1	1	Editorial: Databanks – the compulsory language. LOGKOW – a Databank of evaluated octanol-water partition coefficients (James Sangster). Solubility behavior introducing topoenergetic working principles. Comments on 1-octanol-water partition of several n-alkane related series.	F
1997	1	2	Guide of good practice in metrology (Romanian)	AFI
1998	2	1	Editorial: socio-psychological implications in creation and utilization of a databank (Ioan-Bradu Iamandescu); Behavior in vapor-liquid equilibria (VLE): I. Structural aspects; Behavior in vapor-liquid equilibria: II. Several structures in databanks; Symposium on VDC-4 held on 30 October 1997 at Lubrifin-SA, Brasov (Romania).	F
1998	2	2	Practical course of metrology (Romanian)	AFI
1998	2	3	DIFFUTOR-01: Thermally driven diffusion in pure metals	AFI
1998	2	4	VAPORSAT-01: Databanks of thermally driven VLE. The first 100 simple molecules	AFI
1999	3	1	Editorial: New trends in material science: nanostructures (Dan Donescu) DIFFUTOR: Databanks of diffusion kinetics. VAPORSAT: Databanks of vapor-liquid separation kinetics.	F
1999	3	2	Discussions on Applied Metrology	AFI
2000	4	1	Editorial: Laboratory accreditation and inter-laboratory comparisons (Virgil Badescu) Doctoral Theses – important data banks. GDF intends to open new series of experiments on thermo-physical properties. Some comments on uncertainty: global budget and DFT analysis. Events: The 9th International Metrology Congress, Bordeaux, France, 18-21 October 1999.	F
2000	4	2	Measurement and Calibration.	AFI
2001	5	1	Editorial: Metrology ensures moral and technological progress. Topoenergetic aspects of amorphous-crystalline coupling. I. Composite behavior of water and aqueous solutions (paper presented at nanotubes and Nanostructures 2001, LNF, Frascati, Rome Italy, 17-27 October 2001). Events: Nanotubes and nanostructures 2000.School and workshop, 24 September – 4 October 2000, Cagliari, Italy.	F
2001	5	2	Editorial: Viscosity – a symptomatic problem of actual metrology. Visco-Dens Calorimeter: general features on density and viscosity measurements. New vision on the calibration of thermometers: ISOCALT® MOSATOR: Topoenergetic databanks on molten salts properties driven by temperature and composition.	F

2002	6	1	MOSATOR-01: Topoenergetic databanks for one component molten salts; thermally driven viscosity and electrical conductance.	AFI
2002	6	2	Editorial: HuPoTest - Operator calibration or temporal scale psychic test. MOSATOR: topoenergetic databanks of one component molten salts; thermally driven viscosity and electrical conductance.	F
2002	6	3	Editorial: Quo vadis Earth experiment? ISOCALT® : Report on metrological tests	F
2003	7	1	Editorial: Time – an instrument of the selfish thinking. 1st NOTE: Homoeopathy: upon some efficient physical tests revealing structural modifications of water and aqueous solutions. I. Mixing experiments.	F
2004	8	1	Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.	F
2004	8	2	Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90. Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19th SRH National Congress, 21-22 September 2004, Bucharest, Romania)	F
2005	9	1	AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12th International Metrology Congress, 20-23 June 2005, Lyon, France)	F
2005	9	2	A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).	F
2005	9	3	Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report. Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.	F
2006	10	1	NTC – thermistors -1	AFI
2007	11	1	HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality	F
2007	11	2	MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report	F
2007	11	3	TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties TRESISTOR© - NTC -1 - data bank of NTC thermistors	AFI

2008	12	1	Australian population: life, death and cancer	F
2008	12	2	Pattern of Cancer Diseases	F
2008	12	3	Adiabatic calorimetry – summary description of the demo prototype	F
2008	12	4	Flight QF 30 and even more… Temperature calibration of NTC-thermistors. 1.Preliminary results.	F
2009	13	1	Proposal for interlaboratory comparisons. Calibration of NTC-thermistors (The 14th International Metrology Congress, Paris, France, 22-25 June 2009).	F
2009	13	2	Sudoku – un algoritm de rezolvare. (Sudoku – an algorithm for solution).	AFI
2009	13	3	Cancer and Diabetes – as social diseases. (Open letter to all whom it may concern).	F
2010	14	1	Studies on cement hydration by High Resolution Mixing Calorimetry (HRMC).	F
2010	14	2	Measuring tools for subtle potentials; pas-LED: an efficient measuring tool for subtle potentials.	F
2010	14	3	Upon some features of cancer in Australia: 1982 – 2006.	F
2010	14	4	Cancer as an erosion process in human society.	F
2010	14	5	Cancer erosion in Australian human society: 1982 – 2006.	F
2010	14	6	Cancer erosion in German human society:1980-2008.	F
2011	15	1	Procedures and devices for energy and water saving. (I) (in Romanian).	F
2011	15	2	Structural and relativistic aspects in transforming systems. I. Arrhenius and Universal representations of thermally driven processes.	F
2011	15	3	Topoenergetic aspects of water structuring as revealed by ac electric conductivity.	F
2011	15	4	Topoenergetic aspects of human body	F
2011	15	5	HuPoTest: four month study of a case	F
2012	16	1	DTA study of water freezing. I. Upon some aspects of repeatability.	F
2012	16	2	DTA study of water freezing. II. Statistical features on one week of experiments.	F
2012	16	3	DTA study of water freezing. III. New facts on daily mental field.	F
2012	16	4	Mental field and state of health. Câmpul mental şi starea de sănătate.	F
2013	17	1	DTA study of water freezing. IV. New facts on energy circuits.	F
2013	17	2	DTA study of water freezing. V. Effect of a mental antenna	F
2013	17	3	AC electric conductivity of untreated and mentally treated electrolyte aqueous solutions.	F
2013	17	4	DTA study of water freezing. VI. Mental field in a working day.	F
2013	17	5	DTA study of water freezing. VII. More statistical features on one week of experiments.	F
2013	17	6	HuPoTest: New measurements and results	F

2013	17	7	Time as unique base quantity. (Proceedings of the 16th International Congress of Metrology, 7-10 October 2013, Paris, France).	F
2013	17	8	Eurovision song contest. 1.Basic social aspects	F
2013	17	9	Mental field-water interaction as evidenced by Isothermal Convection Flow Calorimetry (ICFC). I. ICFC description and preliminary results.	F

*) F=free, AFI=ask for invoice.

ERRATA:

VOL	NO	place	was written	must be
15	2	Figure 5	P+	P-
15	3	page 5, row 7 down-to-up	x=2	x=0.2

I encourage readers to advice me any observation.

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