## Real Image of quantum Chemical Reaction : 2013-7-5,7-7

<The hidden,but outrageous role of **charge density wave**(**CDW** field)>

Chemical components and reactions are fatal for our life,however still error classical image has been ruling in the science.The cause is due to lack in recognition on **discontinuity property** both space and time in micro quantum world.**Established academy authority** has been hiding and suppressing those facts.It is nothing,but **obstacles** also for **new energy engineering** such as ***Brown Gas*** or ***Water Fuel*** by pulse electrolysis.

☞:addendum and erruntum 7-7{coulomb explosion ->coulomb implosion,etc in chapter[3]}

### [1]:Introduction to space & time discontinuity in Quantum Mechanics(QM)

(0)**Non contradiction-ness in observable this material world** <addendum7-7>.

This is the most fundamental postulate to build the real science in genenal.None can see W image of event(event **A** and event **not A** simultaneously)in this material world. You never can simultaneously see spear penetrating shield and spear not penetrating shield.If you could see contradictional events,it is not material world,but **no-observable vacuum world.**

(1)**Observability and finiteness & determinism** :

**Natural number set** can be defined by finite and deterministic inductional way as, at first 1 is,and 1＋1＝2,2+1＝3,.....,N,N＋1,...then max number in the set can not be determined. Reciprocal logic of (1) tells if non finite and non deterministic,it is non observable.

(2)**supreme unit building block of matter＝elementary particles.**

**classical image** : small and static ball、deneying this yield quantum image.

**quantum image** : size zero(then it becomes nothing,however it comes out from nothing to anihilate before finite,we intepret so).....***the standard quantum field theory***

(a)**obscurity of real number** $0=\lim N\to 1/N$

For arbitary $\varepsilon>0$, $|1/N|<\varepsilon$. Such $N=1+$integer$(1/\varepsilon)$could be in the set.

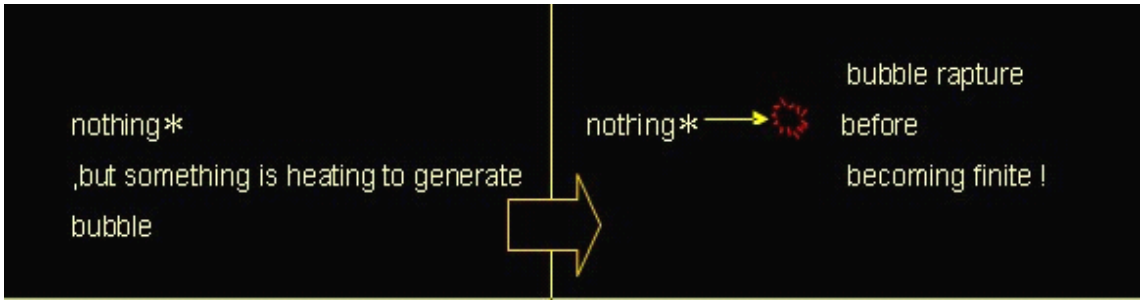
For right term of arbitary small,but finite ε＝1/M(M arbitary positive integer),we could make it so by taking M＜N.That is,the limit must be zero.Then such N must be largest natural number, however we could not determine it(**incompleteness theorem by Goedel**).

We never can tell something definite for something indefinite !!. Thereby,we could not help to evade following proposition.

**Conclusion** : real number " 0 " is nothing,but not nothing<contradiction!!!>.

☞:this contradiction-ness could not be harm to science because its **non-observability**(0).

(b)**Goedel incompleteness theorem:**there must be indetermistic propositon in non-contradictional theory including natural number one.




(c)**Reason why elementary particle can not have finete size** :

Following is citation from ***Landau & Lifshitz's "Clasical theory of field".*** A elementary particle can not have portion by the definition,so it must be rigid body.Then (ideal)rigid body enables **infinite velocity of propagation,**which is contradict with upper limit of propagation by theory of speciall relativity.Thereby elementary particle must be zero spot.

*As the fact,none could succed on theory of finite size elementary particles.

## (3)Vacuum Polarization Chain Reactions.

Any matter dynamics is result of multi-stage reactions of elementary particles.Then most fundamental dynamics is so called **free particle behavior** without no interaction.

(a)**Vaccum Polarization Reaction**(stamdard theory authorized by global academy).

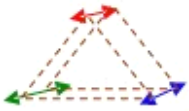
| nothiing(initial) | **pair creation reaction** | **pair anihilation reaction** | nothiing(final) |
|---|---|---|---|
| | +q −q | +q −q | |

As you know,0＝+1－1,matter(**elementary particle** and the pair(anti-particle)) can be created from nothing(quantum vacuum field at anywhere,anytime).Those are to be anihilated into nothing again in a instantaneous time interval(but finite)).Those are extremely microscopically chaotic field ,but macroscopically absolutely calm field.

(b)**dipole** pair of {+q, −q} have opposite sign physical values as ±charge to be cancelled,but exception is **mass energy** which are same as $+mc^2$,while **gravity field**(dot lines) are negative＝－$2mc^2$.Gravity field is also called **guage particle**(**boson**).Matter is called **spinor particle(fermion).**+q −q 〈**dipole notation**〉

(c)**compound particle** such as **nucleon**(proton(uud) and neutron(udd) composed from elementary particle quarks(u,d))**also can be vacuum polarization**<advanced course>.

http://en.wikipedia.org/wiki/Nucleon



Each arrow is dipole of u+~u- and d+~d- quarks.
Triangle itself means nucleon,so the left fig means
**dipole of compound particles by *FP ghost reaction*.**

http://www.777true.net/img006-Quantum-Gravity-Dynamics-the-summary.pdf

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Nucleon is the fundamental particle to compose general matters,so any matter Including mankind＝H could have dipole pair as **H+**～**H-.**Yes you have your gohst at anytime anywhere in vacuum space ,if not so ,you could not move in space.

(d)**chained reaction of vacuum polarization can cause free particle displacement**.

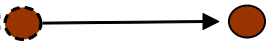
Change is anihilating now stage and creating final stage in **icontinuous time**.

initial stage

medium stage of pair creation
final stage of pair anihilation

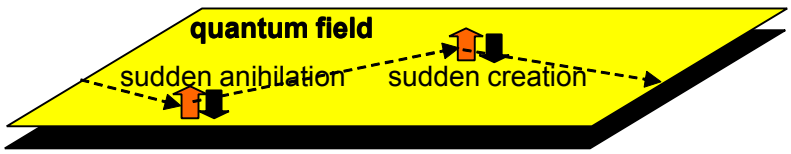
To tell from very beginning,vaccum polarization is chaotic and random events.
Thus you could also understand **random distribution feature of free particle in QM**.
Instantaneous space transportation evidently break constrain low of special relativity theory that states maximum propagation speed never be over light velocity in vacuum.Howeve this constrain low never apply for **event the**(directly)**non observable** in quantum physics.
Quantum Mechanics(**QM**) can be reconstructed from "**observability logic**".
＊Birkov.G& Neumann,J,v;Anna.Math,2nd Ser.,**37**,823(1936).

(e)**classical image:**



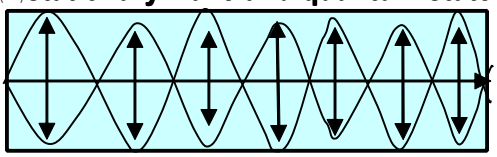
it is mere a continuous straight line displacement in a continuous time & space interval.

(f)**quantum image:**




it is a **discontinuous** random line displacement in an **instantaneous time** .
*Therefore **a quantum particle** non observed could be at many position at a time.
This fact could be proved by famous **quantum W slit difraction experiment.**
It is almost bubble creations and anihilations in a hot curry pan(quantum field).
However clasical image could be reproducted in **statistical averaging** on QM.

(g)**stationary wave and quantum states**



Ordinal wave is travelling one toward one diretion, while those waves become **stationary** by outgoing and reflection wave superposition(resonance state).

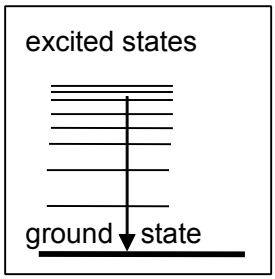
Ⅰ:**free state(particle) of a quantum traveling wave.**

As was mentioned before,free particle is series of randome and dicontineous space migragtion(by dipole chain reactions),however this is a proper state of a quantum dynamical system denoted by so called **wave function**(this is not real number function). Free paticle is rather **contradictional**,because which is **nothing interaction** as the definition,however the actuality is series of **non-observable dipole chain reactions.**

Ⅱ:**bound state(ground level)in compound particle system.**

A typical example of bound state is that of electron state in hydorgen atom with coulomb attractive force interaction.Bound state is also called **stationary state** similar with stationary wave in closed ditch.It is outgoing and reflection waves in **a closed volume** in a compound particle.Then the coulomb interaction acts to confine the traveling wave(free particle) at discrete points on time axsis. This state is also denoted by wave function of an **eigen state**. If the system energy is **lowest**,which is called **ground state** to be unique.

Ⅲ:**higher levels in bound states.**



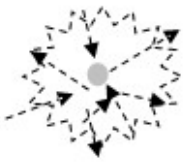

Generally to tell,compound particle system with bound states has infinite upper levels from ground state.Those are called **excited states**,which could transit to ground state by so called **perturbation action**(a small interaction) **from exterior**.In such case, excited states could **not be stationary unique,**but multiple in a narrow levels(ΔE) with **finte life time**(Δt).

(3)**interaction in atom space structure**:

**classical image**:

classical planet model(electron with nuclei)

**quantum image:**



It is an ensemble of discrete spots (**cloud**),to where electrons move discontinuosly and instantaneously

⑷**Time Structure in Interactions**：

What happening in space is non finite spot event,so what happening in time is also not finite time interval.That is **instantaneous event** in Quantum Physics.This fact exactly can be proved due to Heisenberg's uncertainty principle for time and energy or due to Hermitian operator theory.

http://www.777true.net/img005-Quantum-Stochastic-Mechanics-the-summary.pdf

http://www.777true.net/img007-Quick-Guide-to-Quantum-Stochastic-Mechanics.pdf

⑷**Established quantum mechanics could not tell on time progression !!!.**

**<<nothing chemical reactions in hermitian operator theory !!!>>**

＊$H\Psi = ih(\partial \Psi / \partial t)$.

$\Psi$ is a function of time=t and space=**x** variable and yields **complete informations on concerned dynamical system** with possible quantum states. $i\hbar \partial / \partial t$ is called time derivative operator.Above is so called **Schroedinger Equation** of basic one in quantum mechanics.Energy engine of $H$ is called **Hamiltonian** in physics concept.

Then $H$ must represent **energy of dynamical system** concerned,of which energy value must be real number to be observable.Then $H$ is poved to be **Hermitian** in math concept.

As the consequnece,it become also provable $H$ never depend on time(**stationarity**) !!!.

＊The historical first solution was on **Hydrogen atom state** which is stationary.

＊Hermitian 's stationarity was told also by Dr Prigojin,Dr Arimitsu(Tukuba university).

*"From being to becoming,by I.Prigojin"*

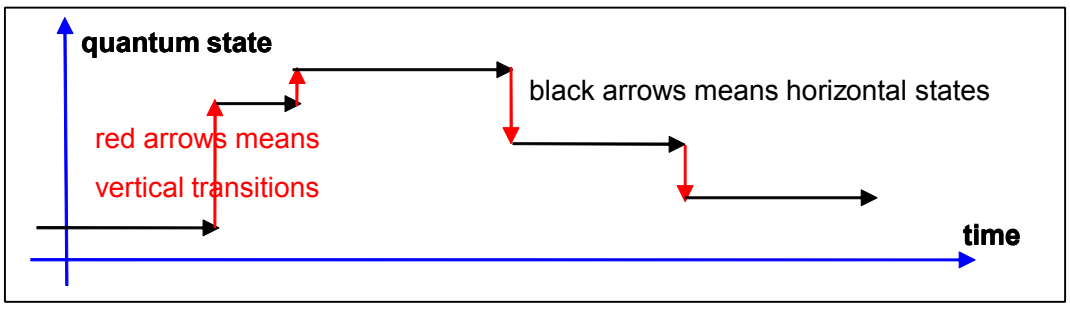
⑷**Reciprocal logic tells that $H$ must be non-Hermitian for time progressional.**

Then energy must be indefinite＝∞(**non observable** !!!),then time must be zero spot !!!.

ΔE.Δt＝$\hbar$. →ΔE＝∞→.Δt＝0.<Heisenberg's uncertainty **theorem** for time and energy>

Above all,such $H$ must be mathematical non regular(singular).But it is all right,$H$ in **quantum field theory** the standard one which can predict elementary particle reaction is certainly **mathematical singular**(which is called product of **hyper-function** in math concept).And the conclusion is **probabilitical theory**,but **not deterministic** one.

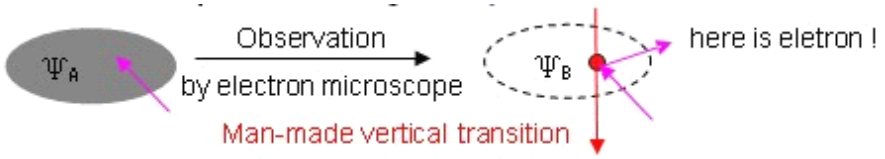
⑷**Image of quantum state transition progression in time axis.**



In quantum world, change is vertical with 0 time interval in elementary process.Typical example is ***Frank Condon Principle for electron cloud transition*** in 0 time interval. This is famous in chemistry field.

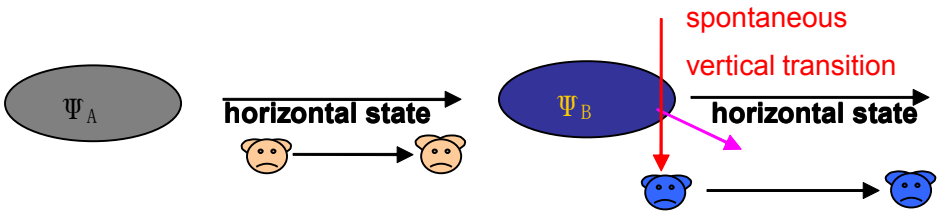
(d)Extremely to tell,all elementary particles state are almost free except at an interaction. Especially **electron**'s role is overwhelming in Science and technology.Then electron is elementary particle which concerns **elementary process(**chemical reaction).The process must be series of discrete vertical one in time axis(fig(c)).

(e)**Shroedinger's dog pardox as for "qunatum states" interpretation.**
Quantum mechanical system is probabilistic,but not determistic.For example,electron postion in hydrogen atom is random,but having statistical distribution.Only by experiment (observation),the position could be determined to be unique.Before observation,we must admit,an electron has many position at a time(**quantum W slit diffraction experiment**). This(the underline portion)is called ***wave packet convergence by observation***.




Now let's assume radio active decaying system,where radiation is probabilitical(no radiation state＝$\Psi_A$、 radiated state＝$\Psi_B$), Before the observation,both state are possible to be. Then someone setted radiation detector which trigger to open poison gas bottle to kill dog. If dog is died,state must be $\Psi_B$ ,or if dog is alive,state must be $\Psi_A$.Now let 's remember before the observation,both state are possible to be.The death or alive of dog is to be determined at a time of observation(wave packet convergence by observation).
This is ridiculous !!.

＊exactly to tel,physical variable commutable(time independent)with **H** is unique before observation,,but non commutable(time dependent)varialbes do wave packet convergence.



(f)**"Answer for convenience,but not complete." <**also see fig(4)(c)>

Note electron position observation is **active** to object to make a reaction causing **instantaneous quantum state transition(vertical transition),**while the latter state transition is **spontaneous** to make observation **passive**,but not active to object. Without observation,quantum state-itself had been determined to be unique**(horizontal state).**

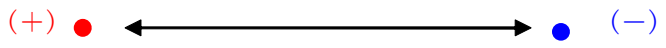
(g)**Thus quantum state in 99,99999....% time is horizontal state without interaction.**

Those are called eigen states of observable $H$ the hermitian operator with energy eigen values. While 0.000000.....1 time is interactional which is due to non hermitian $H_s$.where s means singular.The interactional Hamiltonian determines **transition probability** between eigen states.That is alternating conservative and revolutional as $H \rightarrow H_s \rightarrow H \rightarrow H_s \rightarrow H \rightarrow$

[2]:**Coulomb interaction the quantum image** <advanced course>.

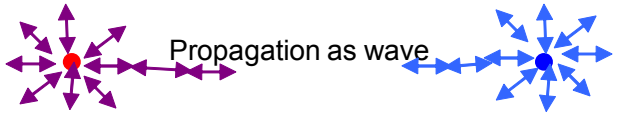
In material science(chemistry),Coulomb interaction is dominant.

Ⅰ:charge and dipole chain in vacuume and in directric material space(permeability= $\varepsilon$ ).

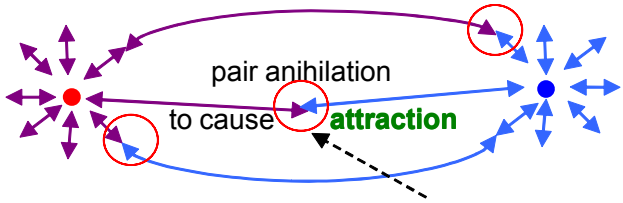



Far length without interaction at first

Ⅱ:dipole chain propagation: wave equation of scalar field $\Phi$ with charge $\rho$, $\Box\Phi = -\rho/\varepsilon$.




Ⅲ:What would happen by collision of dipole chain propagation ?

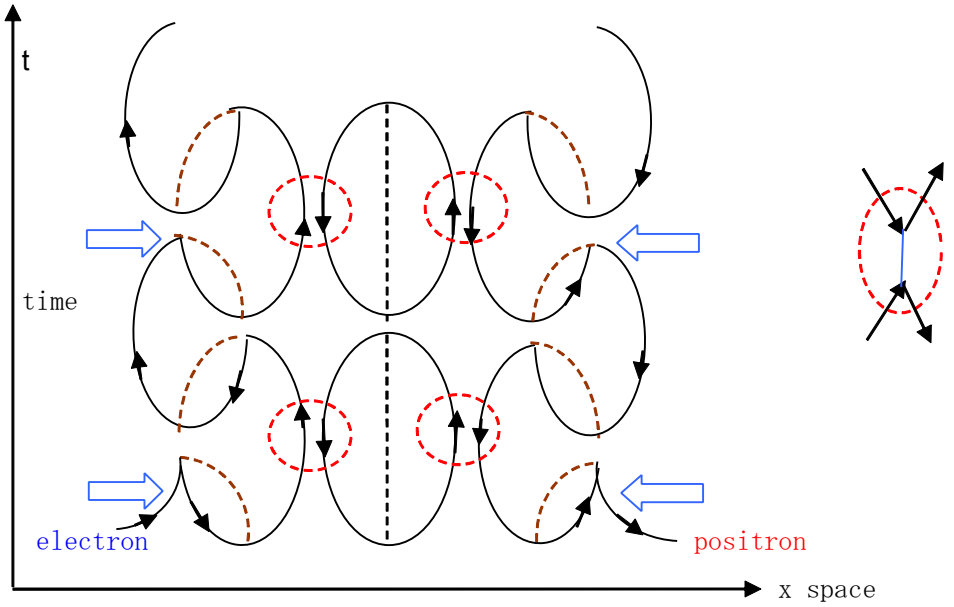



＊QED=Quantum ElectroDynamics

＊QGD=Qunatum GravityDynamics

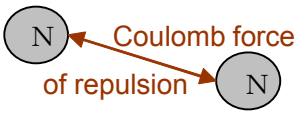
☞:QED never respond to interaction $\underline{\Phi \times \Phi}$ ,but QGD could do it.

Ⅳ:**static attraction force reaction in QED**(Feyman diagram imagined by author)



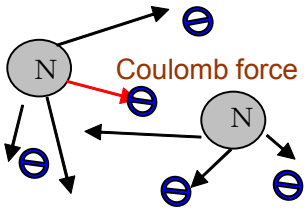

**Attraction force** is caused only by **vacuum polarization anihilation reaction**.

(h)**Classical contineous image** of Coulomb interaction in room temperature nuclear fusion.




If coulomb interaction is **continuos** in time axis,It is hard to imagine nucleis(positive charge)collision between them due to strong repulsion(reaction barrier potential).

(i)**Discontinuous image of Coulomb interaction in room temperature nuclear fusion.**

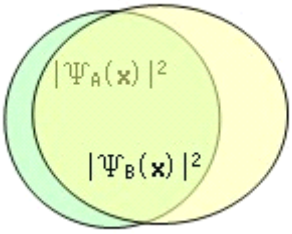



If coulomb interaction is random oriented,It become easy to imagine nucleis(in plasma state)collision between them due to repulsion intercepting by **charge density field** ⊘ applying.

Classical image of nuclear fusion is kinetic accelerating of particles by ultra high temperature to over come their potential barrier(repulsion by charge).However in discontinous image,nothing acceleration for colliding needs ,but overlapping of wave function(plane wave-nization).In other words **catalyzer** by **ion charge density field** applying could overcome reaction potential barrier to cause **free particle** without potential barrier..

http://www.777true.net/img0010-General-Analysis-on-Room-Temperature-Nuclear-Fusion.pdf

(j)**Collision probability by wave packet overlapping.**




Two particles have wave function $\Psi_A(x)$ and $\Psi_B(x)$,then their position ovelapping probability is Pc.

V is volume for integral region

$1=\iiint_V dx^3.\ |\Psi_A(\mathbf{x})|^2.$

$1=\iiint dx^3.\ |\Psi_B(\mathbf{x})|^2.$

$1 \geqq Pc=\iiint dx^3.\ |\Psi_B(\mathbf{x})|^2 |\Psi_B(\mathbf{x})|^2 \geqq 0.$

Therefore,if wave functions are **plane ones** (free particle),$P_C$ become 1 the max value.

If those have nothing overlapping region

Pc＝0(minimum value).

Note particle **without finite size** seems to be difficult to collide with each other,however,as was mentioned in above,their collision probability become finite by their wave packet overlapping scheme.

## [3]:Mechanism of Coulomb Implosion is charge gradient decreasing.

Burning Brown Gas is so called implosion the instantaneous volume shrinking, which could be also explosional increasing of particle density(**Coulomb Implosion**).

http://www.777ture.net/Brown-Gas-the-mechanism-of-the-obsucurity.pdf

A charge density field acts as **catalyzer** to reduce **reaction barrier potential** without heat.

(1)**scale transformation on space variables in manybody Hamiltonian.**

http://www.777true.net/img0010-General-Analysis-on-Room-Temperature-Nuclear-Fusion.pdf

$$H(\mathbf{r},\mathbf{R})=\Sigma_j^N[-\hbar^2/2m(\partial/\partial \mathbf{r}_j)^2]+\Sigma_k^M[-\hbar^2/2m(\partial/\partial \mathbf{R}_j)^2]$$
$$+\Sigma_j^N\Sigma_k^N[ee/8\pi\varepsilon|\mathbf{r}_j-\mathbf{r}_k|]+\Sigma_j^M\Sigma_k^M[qq/8\pi\varepsilon|\mathbf{R}_j-\mathbf{R}_k|]$$
$$+\Sigma_j^N\Sigma_k^M[eq/4\pi\varepsilon|\mathbf{r}_j-\mathbf{R}_k|].$$

$$H(\mathbf{r}/\lambda,\mathbf{R}/\lambda)=\Sigma_j^N[-\hbar^2/2m(\partial/\partial\lambda^{-1}\mathbf{r}_j)^2]+\Sigma_k^M[-\hbar^2/2m(\partial/\partial\lambda^{-1}\mathbf{R}_j)^2]$$
$$+\Sigma_j^N\Sigma_k^N[ee/8\pi\varepsilon|\lambda^{-1}\mathbf{r}_j-\lambda^{-1}\mathbf{r}_k|]+\Sigma_j^M\Sigma_k^M[qq/8\pi\varepsilon|\lambda^{-1}\mathbf{R}_j-\lambda^{-1}\mathbf{R}_k|]$$
$$+\Sigma_j^N\Sigma_k^M[qq/4\pi\varepsilon|\lambda^{-1}\mathbf{r}_j-\lambda^{-1}\mathbf{R}_k|]$$

$$=\langle\lambda^2\rangle\{\Sigma_j^N[-\hbar^2/2m(\partial/\partial\mathbf{r}_j)^2]+\Sigma_k^M[-\hbar^2/2m(\partial/\partial\mathbf{R}_j)^2]\}$$
$$+\langle\lambda\rangle\{\Sigma_j^N\Sigma_k^N[ee/8\pi\varepsilon|\mathbf{r}_j-\mathbf{r}_k|]+\Sigma_j^M\Sigma_k^M[qq/8\pi\varepsilon|\mathbf{R}_j-\mathbf{R}_k|]$$
$$+\Sigma_j^N\Sigma_k^M[qq/4\pi\varepsilon|\mathbf{r}_j-\mathbf{R}_k|]\}.$$

$H(r/\lambda, R/\lambda) \equiv \langle \lambda^2 \rangle$**{free particle terms}**$+\langle \lambda \rangle$**{potential terms}**$\equiv T+V$.

(2) $\lambda \gg 1$ → **{free particle terms} becomes dominant !!**

Shortening space axis=**r** by larger $\lambda$ is equivalent to particle density increasing.

Or **charge density garadient** become rather monotonous to be zero electfric field.

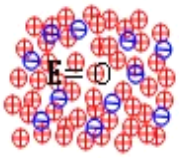
**Higher,but constant Charge Density** field can cause **lowering potential barrier.**

**Free particle-nization** is source of **reactions** by wave packet expanding.

This is a varidity for enabling **room temperature nuclear fusion** on Pt **catalyzer**

This is a cause of **Coulomb Implosion** making pseudo higher temperature in Brown gas.

☞: In macroscopic view,**charge is neutra**l,but becoming not neutral in some local.




High charge density with monotonous distribution(grad $\rho \sim 0$) causes less weak electrical field.=**E**

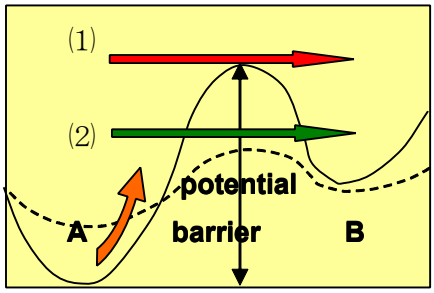
$\square\Phi = -\rho/\varepsilon \rightarrow \square \mathbf{E} = \mathrm{grad}\,\rho/\varepsilon = 0 \rightarrow \mathbf{E} = 0$

This is a cause of making free particle by **CDW**(charge density wave)..

(3) $\lambda \ll 1$ → **{potential terms} becomes dominant !!**

This is equivalent to cause lowering temperature to be stable solid.

(4)**Fundamental two method for overcoming potential barrier in chemical reaction.**




In order to accomplish state transition from **A** to **B**(chemical reaction),there are two fundamental method (1) & (2).

(1)**Explosional.**

**Temperature rise by heating=kinetic energy >potential barrier.**

Heat is something energy injection by **conduction,convection** and **radiation**.

(2)**Coulomb Implosional.**

**kinetic energy >potential barrier decreasing by charge density(CD)increasing.**

The effect is to cause **potential gradient more flat by CD field !!**

**Summary Note:**

⑴**elementary particle**(electron) is spot being,and the reaction time is zero interval.

☞:**compound particle** such as nuclei,or molecule,those could be considered as finite volume space as field for dynamical motions of each elements<see⑶>.

*elementary particle  compound particle as a field for dynamical motions

⑵full **free particle** without any interaction become **biggest area** plane wave in QM.

⑶**bound particle** such as electron in hydrogen is **semi-free particle** with **local area** distribution due to Coulomb attraction force interaction from nuclei. However those are **not always** connected with so called **electrical force line** of Coulomb one(classical image).

$H \rightarrow H_S \rightarrow H \rightarrow H_S \rightarrow H \rightarrow H_S \rightarrow H \rightarrow H_S \rightarrow \cdots\cdots\cdots$

⑷Chemical components in general are **many bound electrons** with molecule's nucleis due to **Coulomb attraction force** from nucleis.Their chemical stability is due to those force which is called **potential barrier** for not to cause chemical reaction easily.

⑸Those **chemical system energy**≡E is sum of **each particles kinetic energy**≡T as free particles and **potential energy**≡V due to repulsion and attraction forces between charges of particle(**Coulomb forces** ). That is ,E＝T+V＜0. That is ,V is stronger than T.
Note attraction force for "**form stability"** is negative energy !!

⑹In order **to cause chemical reaction**,there are two ways,**heat**(**or something energy injection** to T) or **catalyzer(charge density field** applying to.reduece potential barrier V)
This report' s aim is strong notifying on the latter(**CDW**).

**Postscript:**Whole details of qunatum mechanics could not be mentioned in this papaer, which is not the aim at this time,so this could not help to be rather coarse explanations.
I have a written book in English,if someone's help be,it should be publication.

**Appendix:Water and the componetns.**

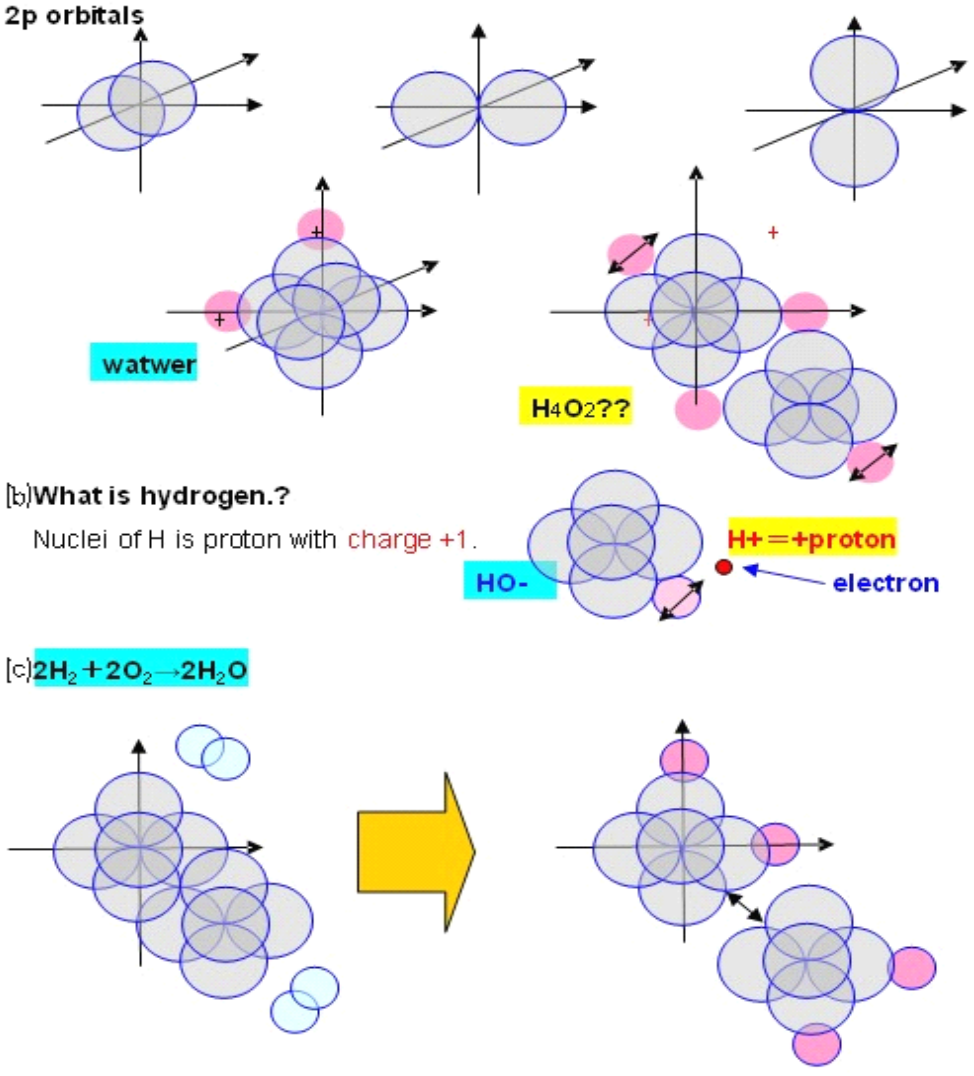
**What is water ? from view of quantum chemistry.**

Following are quantum images due to orbital configuration.

(a)**What is oxygen**

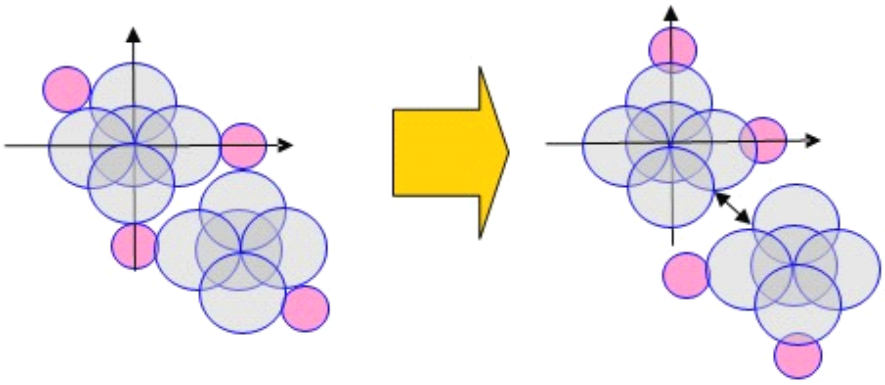
| | | |
|---|---|---|
| $2s^2 2p^4$ <br> $_8\mathbf{O}_{16}$ | $2s^2 2p^5$ <br> $_9\mathbf{F}_{19}$ | $2s^2 2p^6$ <br> $_{10}\mathbf{Ne}_{20}$ |

**Ne** has **strong stable orbital** of $2s^2 2p^6$. Thereby,O in water accomplishes this orbital by getting two electron from 2H.Then the orbital become -2 negative charges




Note both surface of O2 and H2 are negative elctron clouds,which seems negative charges for being **potential barrier** ?!. Unless the barrier,partcles could easily access to react !!!

(d) **$H_4O_2$??→$2H_2O$**



Note surface of **$H_4O_2$** is mix of negative and positive to be nurtral,which seems less **potential barrier** in **many body system** of **$H_4O_2$** , to cause easy reaction !!!