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About Internal Force of Gases

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ABSTRACT

This is the most important, first time, the internal force of gases is measurable. The internal force of the gases in the gas container, as well as the atmosphere of the earth and other celestial bodies, can be measured. The internal force has a significant role in the behaviour of the gases as in the gas container as well as the atmosphere of the earth and other celestial bodies. Internal force may help to assume the most accurate weather reporting.

Keywords:

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INTRODUCTION

A gas possesses two kinds of forces. One is a force applies to the whole inner surface area of gas container call it as the inner force. And the other is a force refers to a portion of the outer surface area of tiny constituent particles like atoms, molecules etc., of gases covered by the infrared wave force, call it as an internal force. Palchoudhury gas theory and Palchoudhury gas equation ($PS = CnAT$, where P is the pressure, S is the inner surface area of a closed gas container, i.e. gas inner surface area, C is the gas constant, n is the number of moles, T is the temperature, A is the portion of the outer surface area of molecules covered by the heat energy wave, i.e. infrared wave). Both forces-the inner force and internal force can be measured. The inner force depends on S (Inner surface area of a gas container), and internal force depends on A (a portion of the outer surface area of all tiny particles-atoms, molecules of the constituent gas covered by the infrared wave) (Palchoudhury, 2016). Here $PS = F$ and $PS \propto A$ and A is a factor that holds some internal force (Palchoudhury, 2017).
Inner force is PS and internal force is AP. The Palchoudhury gas theory and Palchoudhury gas equation have a profound potency applicable to all phenomena of gases. In the meantime, some events explained according to Palchoudhury gas theory. S (Inner surface area), A (outer surface area), the effect of infrared wave force with inner surface area/outer surface area is the outstanding invention of gas behaviour. We can independently explain all kind behaviour of gases with the help of the conception-Inner force and internal force according to Palchoudhury gas theory. We also can clarify about the compression and expansion of gases, about the phenomena isochoric and isobaric process (thermo-dynamical conversion), a cause of critical stages, atmospheric behaviour - the wind blows (storm, cyclone etc.) of the earth and other celestial bodies and many other events.

IMPACT OF HEAT

Heat, i.e. infrared wave holds some force during play up and down in the universe like an ocean wave. Infrared wave exerts some force on the outer surface of tiny particles like atoms, molecules, etc. And in turn, the corresponding force of the infrared waves consecutively and cumulatively exerts an effect on the inner surface of a closed gas container, i.e. the surface of the inner boundary of gases through tiny particles-atoms, molecules. Heat, i.e. infrared wave holds some force that transfers to gases and gases become hot. Again, some external force applies to gas that forces transfers into the heat of gases. Heat, i.e. infrared wave force converts into inner force and internal force of gases in isochoric process & isobaric process shown in Table1 and Table 2.

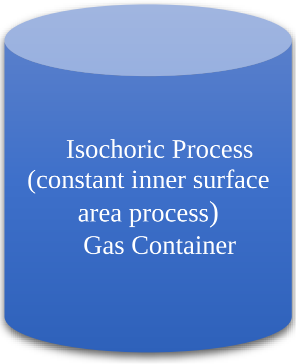

Fig. 1 In an isochoric process, in a closed gas container with the increasing/decreasing temperature other than inner surface area all variable component changes as well as inner force/internal force changes.

Table 1. The force (N) on surface area of gases on increment of 1 K temperature when whole inner surface area of the container and covered outer surface area of molecules remain constant (Isochoric process) for individual gases

Common Gases	Volume (L/dm³) of the Gas container	Number of Mole	Constant (MPa/mole-kelvin)	Covered outer surface area of molecules (dm²)	Inner surface area of gas container for gases (dm²)	Temperature (Kelvin)	Pressure (MPa)	1 Kelvin (273+1=274) increased temperature	Pressure (MPa) after increment temperature 1 K	A force on whole inner surface area before increment 1 K temperature [when[column (5) & (6) constant] 1 MPa=10000 N/dm²	A Force (N) on whole inner surface area after increment 1 K temperature [when[column (5) & (6) constant] 1 1 MPa=10000 N/dm² (inner force)	Differential force (N) after increment of 1 K temperature of gases [(12)-(11)]	Total Force (N) on 'A' covered outer surface area of molecules of gases by infrared wave force (internal force)
	V	n	C	A	K	R	P		P	(6) X	(6) X (10)		(5)X(10)X10000
	(2)	(3)	(4)	(5)	(6)	(7)			(10)	(11)	(12)	(13)	(14)
	0.05	1	6.68070450084903	0.0590517202	0.656343	273	164.091721	274	164.6927891	1077004.364	1080949.435	3945.070929	97253.925
	0.2	1	6.68070450084903	0.0048322290	1.65388	273	5.32878616	274	5.348305521	88131.75412	88454.58106	322.82693815	258.44237
Carbon Dioxide	22.4	1	6.68070450084903	0.0021239365	38.42815	273	0.10080381	274	0.101173059	38737.04029	38878.93421	141.8939205	2.1488515
Helium	0.2	1	6.68070450084903	0.0115971835	1.65388	273	12.7889037	274	12.83574953	211513.1825	212287.956	774.7735621	1488.5854
Neon	0.2	1	6.68070450084903	0.0107696341	1.65388	273	11.8763158	274	11.91981875	196420.0682	197139.5557	719.4874295	1283.7209
Hydrogen	0.2	1	6.68070450084903	0.0113101044	1.65388	273	12.4723246	274	12.51801073	206277.3413	207032.936	755.5946568	1415.8001
Argon	0.2	1	6.68070450084903	0.0091766898	1.65388	273	10.1196814	274	10.15674983	167367.4354	167980.503	613.0675290	932.05343
Oxygen	0.2	1	6.68070450084903	0.0095845067	1.65388	273	10.5694053	274	10.60812105	174805.3309	175445.6435	640.3125675	1016.7361
Nitrogen	0.2	1	6.68070450084903	0.0096024930	1.65388	273	10.5892398	274	10.62802827	175133.3708	175774.885	641.5141788	1020.5557
Carbon monoxide	0.2	1	6.68070450084903	0.0094417960	1.65388	273	10.4120298	274	0.45016905	172202.5277	172833.3062	630.77848964	986.68364
Methane	0.2	1	6.68070450084903	0.0079171712	1.65388	273	8.73073535	274	8.762716068	144395.9378	144924.8506	528.9228125	693.75923
Ammonia	0.2	1	6.68070450084903	0.0030548355	1.65388	273	3.36874875	274	3.381088485	55715.07794	55919.16248	204.0845346	103.28669

Data (column 1 to 8) collected form S. Palchoudhury (2016), 1 MPa=10000 N/dm², N= Newton (Force)

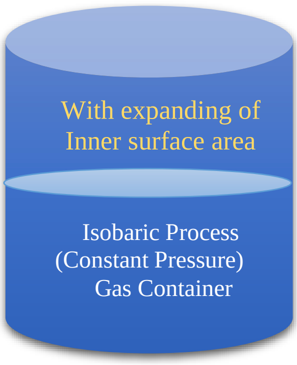

Fig. 2 In an isobaric process, in a gas container (With expanding of the inner surface area) with the increasing/ decreasing temperature other than pressure all variable component changes as well as inner force and internal force changes.

Table .2 The force (N) on surface area of gases on increment of 1 K temperature when pressure and covered outer surface area of molecules remain constant (Isobaric process) for individual gases.

Common Gases	Volume (L/dm^3) of the Gas container	Number of Mole	Constant (MPa/mole-kelvin)	Covered outer surface area of molecules (dm^2)	Inner surface area of container (dm^2) for gases	Temperature (Kelvin)	Pressure (MPa)	1 Kelvin (273+1=274) increased temperature	Inner surface area (dm^2) of gas container after increment temperature 1 K	A force before increment 1 K temperature [when A column (5) & (8) constant] 1 MPa=10000 N/dm^2 (inner force)	A Force (N) on inner surface area after increment 1 K temperature [when A column (5) & (8) constant] 1 MPa=10000 N/dm^2 (inner force)	Differential force (N) after increment of 1 K temperature of gases [(12)-(11)]	Total Force (N) on 'A' covered outer surface area of molecules of gases by infrared wave force (internal force)
	V	n	C	A	S	R	P	T	S	F= (6) X (8)	F= (8) X (10)		(5) X(8)X1000
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Carbon Dioxide	0.05	1	6.68070450084903	0.0590517202	0.656343	273	164.091721	274	0.65874709	1077004.364	1080949.435	3945.070929	96898.98367
	0.2	1	6.68070450084903	0.0048322290	1.65388	273	5.32878616	274	1.659938651	88131.75412	88454.58106	322.8269382	257.4991484
	22.4	1	6.68070450084903	0.0021239365	38.42815	273	0.10080381	274	38.56891182	38737.04029	38878.93421	141.8939205	2.141008991
Helium	0.2	1	6.68070450084903	0.0115971835	1.65388	273	12.7889037	274	1.659938651	211513.1825	212287.956	774.7735621	1483.152637
Neon	0.2	1	6.68070450084903	0.0107696341	1.65388	273	11.8763158	274	1.659938651	196420.0682	197139.5557	719.4874295	1279.035751
Hydrogen	0.2	1	6.68070450084903	0.0113101044	1.65388	273	12.4723246	274	1.659938651	206277.3413	207032.936	755.5946568	1410.632934
Argon	0.2	1	6.68070450084903	0.0091766898	1.65388	273	10.1196814	274	1.659938651	167367.4354	167980.503	613.0675290	928.6517719
Oxygen	0.2	1	6.68070450084903	0.0095845067	1.65388	273	10.5694053	274	1.659938651	174805.3309	175445.6435	640.3125675	1013.025353
Nitrogen	0.2	1	6.68070450084903	0.0096024930	1.65388	273	10.5892398	274	1.659938651	175133.3708	175774.885	641.5141788	1016.83101
Carbon Monoxide	0.2	1	6.68070450084903	0.0094417960	1.65388	273	10.4120298	274	1.659938651	172202.5277	172833.3062	630.7784896	983.0826074
Methane	0.2	1	6.68070450084903	0.0079171712	1.65388	273	8.73073535	274	1.659938651	144395.9278	144924.8506	528.9228125	691.2272646
Ammonia	0.2	1	6.68070450084903	0.0030548355	1.65388	273	3.36874875	274	1.659938651	55715.07794	55919.16248	204.0845346	102.9097335

Data (column 1 to 8) collected form S. Palchoudhury (2016), 1 MPa=10000 N/dm^2, N= Newton (Force)

Inner force of gases before and after an increment of temperature in the isochoric and isobaric process is shown in column (11) & (12) in both tables – I & 2. The difference of inner force of gases between the before and after the increment of temperature in the isochoric and isobaric process is shown in column (13). Internal force of gases for the same temperature in the isochoric and isobaric process is shown in column (14). Inner force & internal force at the same temperature in the isochoric and isobaric process is different for different gases. Inner & internal force have a significant role in all kind of behaviour of gases.

A gas possesses two kinds of forces. One is a force applies to the whole inner surface area of gas container call it as the inner force. And the other is a force refers to a portion of the outer surface area of tiny constituent particles like atoms, molecules etc., of gases covered by the infrared wave force, call it as an internal force. In general, molecules and infrared wave co-exist in gaseous substances, and there is a considerable gap between particles. External force over than the inner force requires to compresses the inner surface area as well as the volume of gases. The ongoing compression, the distances between molecules decreases and position of particles re-arrange with infrared waves. The external force cannot compress a gas without reducing temperature where molecules re-arrange relatively with infrared waves in a manner making a bond like crystal bond. And this situation is the critical state of gases. The internal force takes a significant role in the critical temperature, pressure, inner surface area of gas and liquefaction. Until the internal force with the variation of temperature decreases adequately, gases cannot compress or liquefy in the critical stage. The external force should be over than the inner force and internal to compress and liquefy a gas.

ATMOSPHERIC BEHAVIOR

The boundary of the atmosphere of the earth in the different stage limits by the gravitational pull treat as the inner surface of the spherically shaped container. The atmospheric gas experiences both forces like inner force and internal force. The potency of the inner force and the internal force of the atmosphere of the earth measures with the observed data by an imaging space within a small sphere (or any shape) throughout the atmosphere of the planet. The data within the imaginary field like the inner surface area of the little spherical shaped space, temperature, pressure, gas constant readily available by general observation. So on the outer surface area of molecules of constituent atmospheric gas measures according to Palchoudhury gas equation $PS = CnAT$. The internal force $=$ AP is measurable. In this respect, a survey and mapping may go throughout the earth's atmosphere. The total inner force and internal force of all small space is the inner and internal force of the atmosphere of the planet may be calculated. This method may help for more accurate weather reporting of the earth. This technique may extend in all celestial bodies of the universe for measuring both forces. At night, for want of the sun's heat and in the day, for available the sun's heat, the inner and internal force varies at different places throughout the atmosphere of the earth. For the variation of the inner and internal force in the separate area throughout the atmosphere of the planet and to make a balance between the forces, the differential inner and internal force are the underlying causes of the behaviour atmosphere of the earth like the wind blows (storm, cyclone etc.). All small bodies like the man, animal, trees and other on the planet feel the internal force, an inner boundary of the different stage of the earth atmosphere feel inner force.

Table. 3 The Behavior of gases at critical stage

Common Gases	Critical Volume (cm^3)	Critical Volume (dm^3) [Convert from col. (2)]	Number of Mole	Critical Pressure (MPa)	Critical Inner surface area of container (dm^2)	Critical Temperature (Kelvin)	Constant (MPa/mole-kelvin)	Covered outer surface area of molecules in critical stage	Total Force (N) on critical inner surface area 1 MPa=10000 N/dm^2 (inner force)	Total Force (N) on 'A' covered outer surface area of molecules of gases by infrared wave force (Internal force) in critical stage
	Vc	Vc	N	Pc	Sc	Tc	C	A	(5)*(6)*10000	(5)**10000
	(2)	(3)	(4)	(5)	(6)	(7)			(10)	(11)
Hydrogen	65.00	0.0650	1	1.297	1.027956562	33.20	6.680704501	0.006011106	13332.5966	77.96404598
Helium	57.2	0.0572	1	0.227	0.846052685	5.190	6.680704501	0.005539029	1920.539596	12.57359601
Oxygen	73.4	0.0734	1	5.04	1.210334730	154.6	6.680704501	0.005906147	61000.87039	297.6698277
Nitrogen	89.5	0.0895	1	3.39	1.430051171	126.2	6.680704501	0.005750024	48478.73471	194.9258142
Neon	41.7	0.0417	1	2.760	0.727140843	44.40	6.680704501	0.006765850	20069.08728	186.7374702
Argon	74.6	0.0746	1	4.90	1.177144673	150.9	6.680704501	0.005721560	57680.089	280.356416
Methane	98.6	0.0986	1	4.60	1.478626052	190.6	6.680704501	0.005341596	68016.7984	245.7134096
Carbon dioxide	94.0	0.0940	1	7.38	1.096247283	304.1	6.680704501	0.003982229	80903.04946	293.8884855
Carbon monoxide	93.1	0.0931	1	3.50	1.514896793	132.9	6.680704501	0.005971781	53021.38777	209.0123227

Source: Data in table of Column (2), (5) and (7) are collected from 3.5 Critical constants and second virial coefficients of gases (National Physical Laboratory), (Kaye & Laby, 2016)

Inner force, as well as internal force, is lower of gases under critical stage shown in table-3. So, gases can be compressed and liquefied easily by adequate external force. To compress or liquefy gases will have to consider the underlying cause both about the inner force and internal force of gases.

CONCLUSION

This is the most important, first time, the internal force of gases is measurable. The internal force of the gases in the gas container, as well as the atmosphere of the earth and other celestial bodies, can be measured. The internal force has a significant role in the behaviour of the gases as in the gas container as well as the atmosphere of the earth and other celestial bodies. Internal force may help to assume the most accurate weather reporting.

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