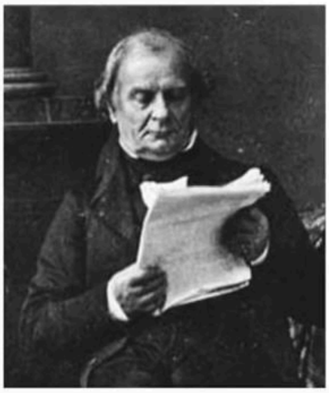
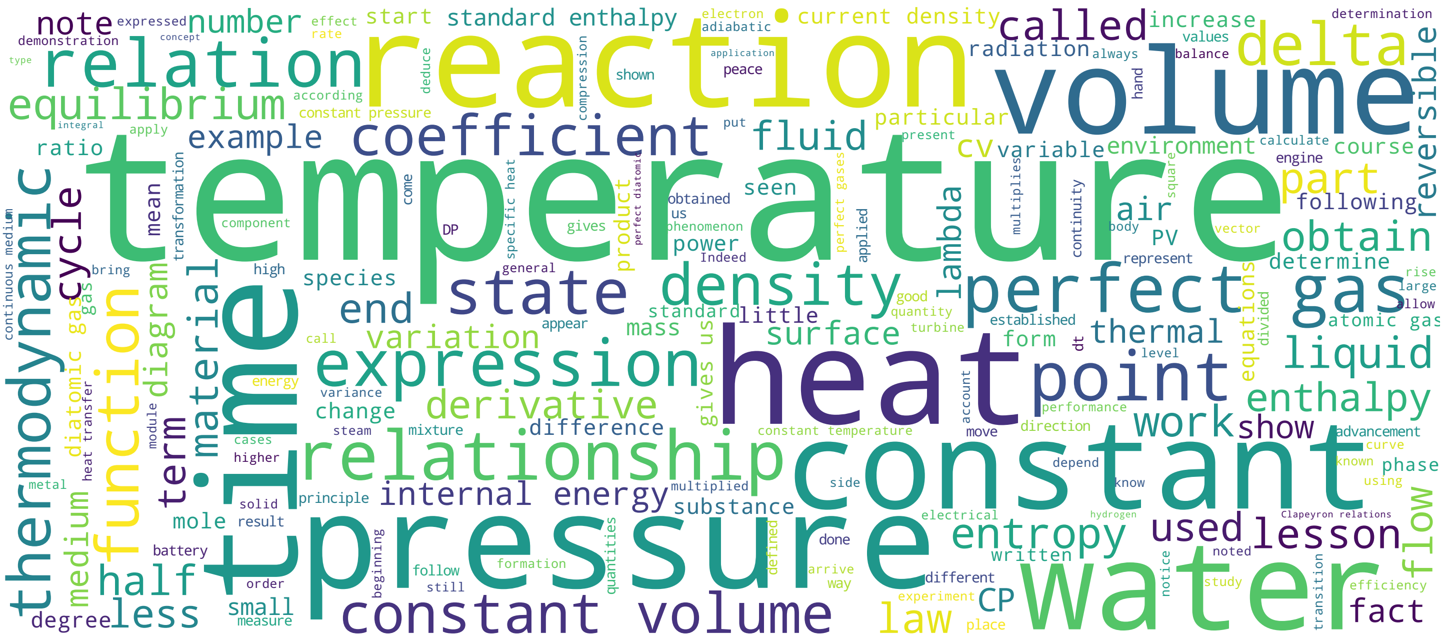
Thermodynamique

Coefficients calorimétriques : gaz parfait



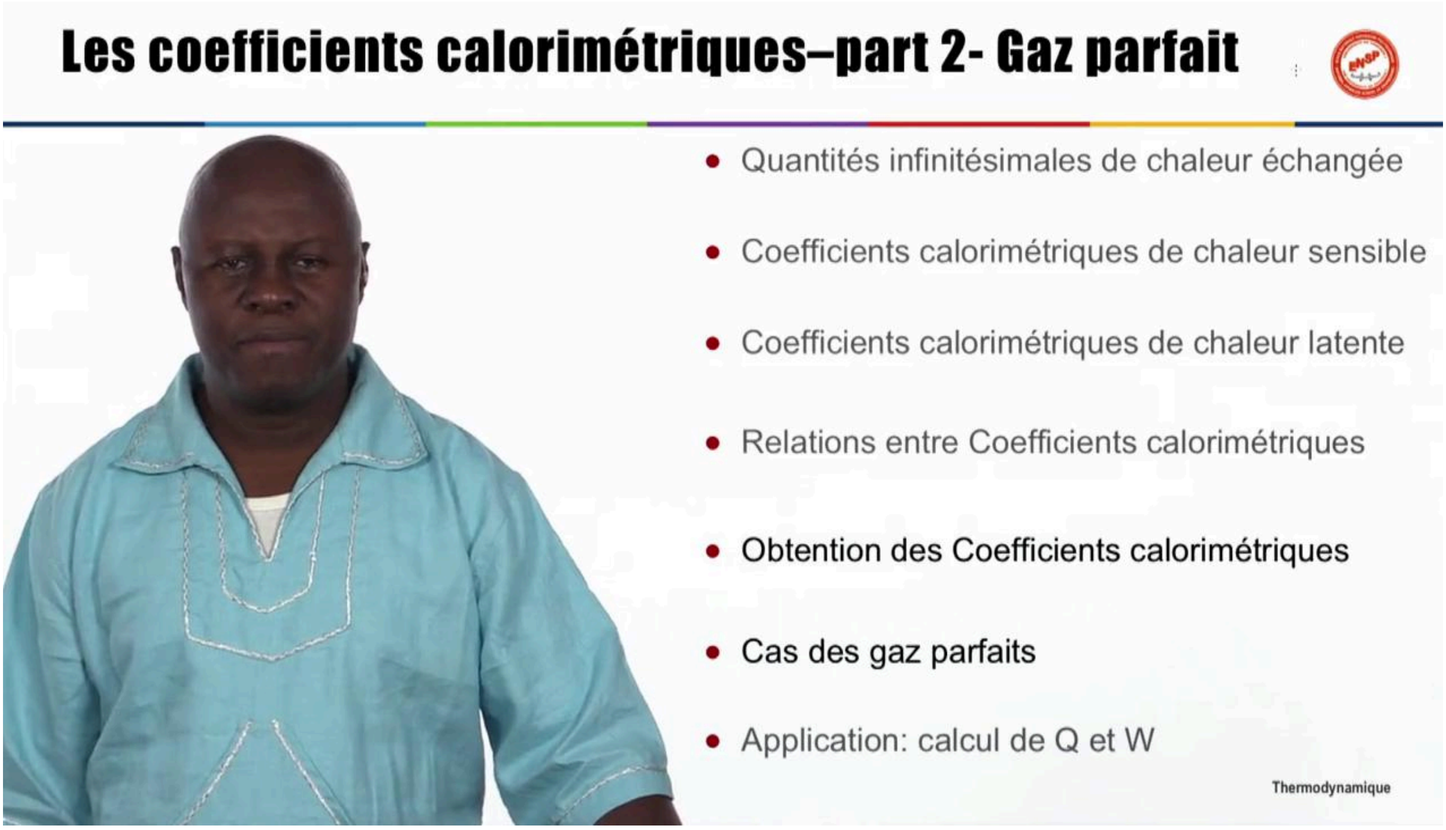
Emile Clapeyron, 1799-1864

Ing. Dr. Paul-Salomon NGOHE-EKAM



Video

EPFL

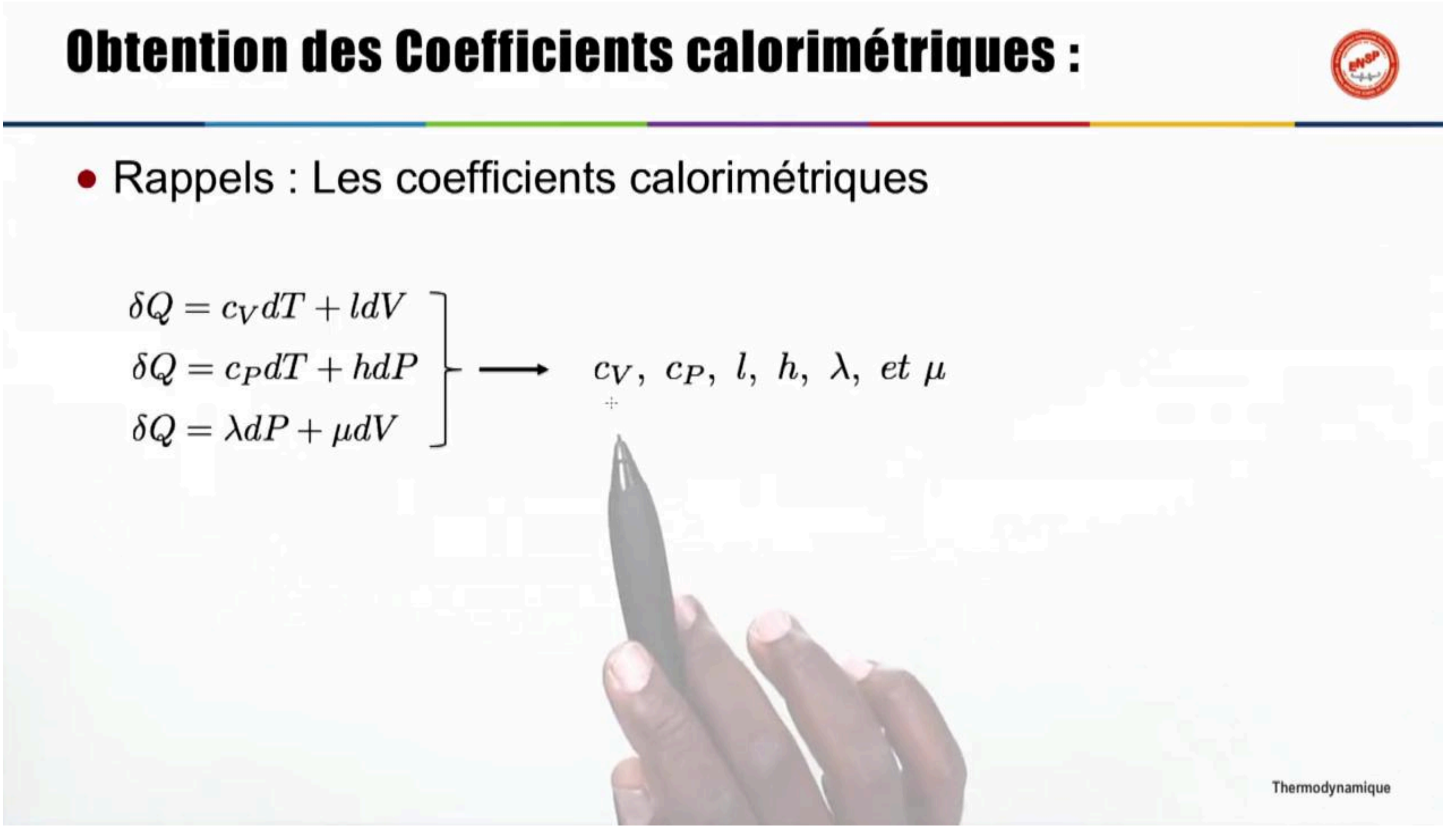


You are welcome to the second part of the lesson at the mythical cousins. This is a lesson that is part of it. From Keyword Thermodynamics Coordinated by PDF. The Federal Institute of Technology in Lausanne, Switzerland. And I'm here, I have the doctor. Paul Salmon calls for state premises in Cameroon. In this second part, therefore the trade. We'll focus on the bold, not the fact. We will see how, in general, the group 500 obtained. And we are going to make the application instructions obtained from the gas to do so. We recall that in the previous lesson. We have spoken of infinitesimal quality, of exchanged heat. It is when infinitesimal, it leaves. The room specialists allowed us to define the coefficient of sensible heat and latent heat. Thus, we have established some relationships, that they have flanks like that on automatic. Pros. The lesson or the game. Here we are, we will essentially show how the value or values of ethical values are obtained. And we will conduct these values for perfect gases. The lesson that comes from the third part. Used for trades for the detonation of bastards, apes and ape work.

Notes

Summary

0m 05s

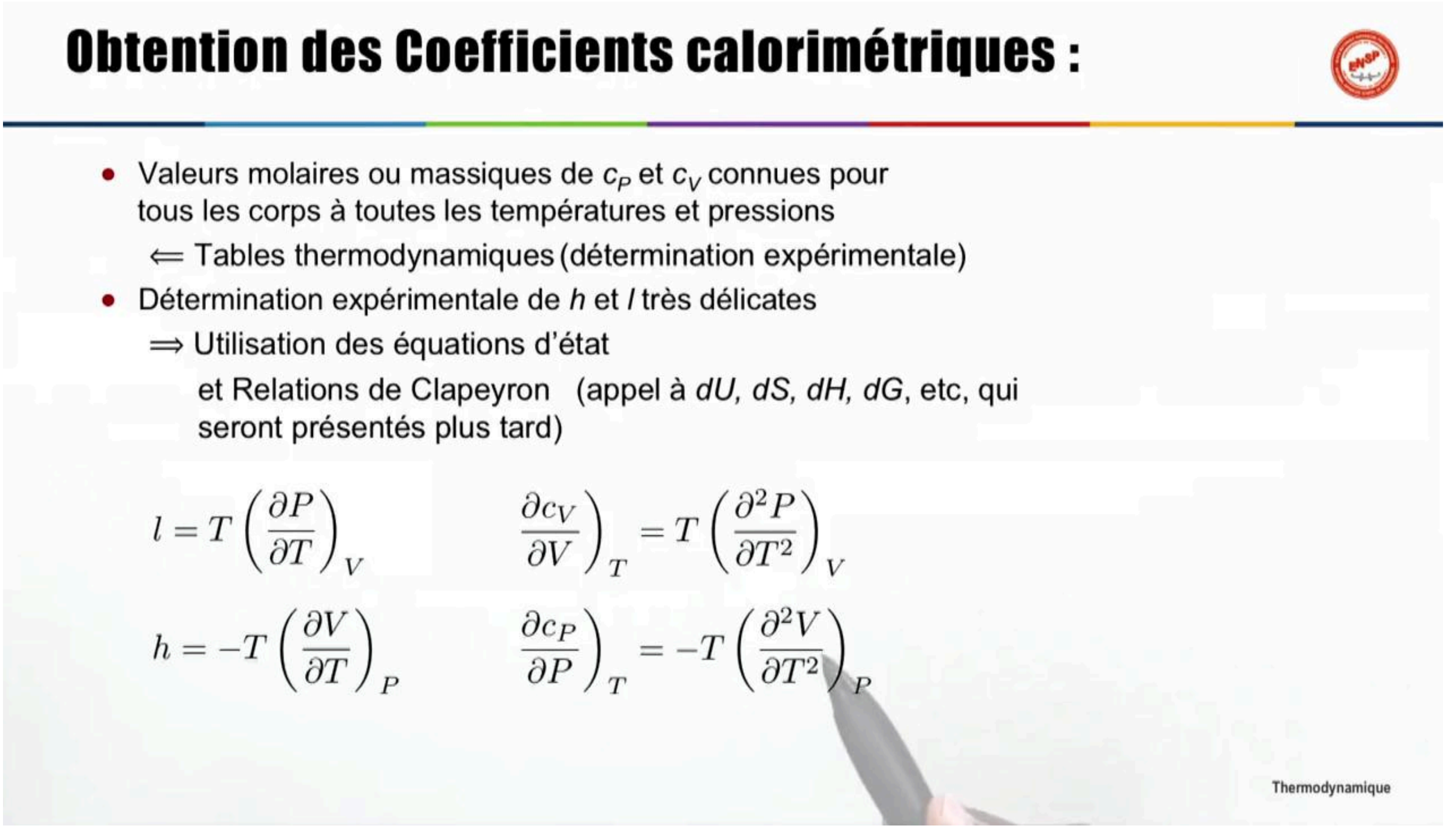


What about getting mythical concerts? Recall that we have called the six coefficients homeotic which allowed a valid insulation of steps 2 to 2, described in infinitesimal form, tinged with heat and changed a little. The system and the mullet is the trust file, it's bcp alas lambda and MU.

Notes

Summary

1m 45s



Well the slalom coefficient or cp and cv are usually obtained. At all temperatures. In an experimental way. And this is how thermodynamic tables are often constituted. However. The determination of the coefficients as and l is very delicate from an experimental point of view. From the obtaining passes therefore by using the equations of state of each thermodynamic system, but also the use of Clapeyron relations. But most of the time, what do the great that have not yet been presented in this thermodynamics course. We will simply present these relationships without dismantling them here. And according to demonstrate it later when. The of. Internal energy, entropy, enthalpy and edible will be of interest. The Clapeyron relations are as follows. The first one, she was at the later. Comedy, multiplies, develops to carry it at constant volume. Second place was at half the lifts of V over constants. The third, derived from cv with respect to at V at constant temperature, was reported as multiplied. From the second DP to offset a constant volume. The fourth one gives the to raise. Not enough CP in relation to payroll is a constant plateau that is equal to less than.

Notes

Summary

2m 13s

Obtention des Coefficients calorimétriques :

- Valeurs molaires ou massiques de c_P et c_V connues pour tous les corps à toutes les températures et pressions
  $\Leftarrow$ Tables thermodynamiques (détermination expérimentale)
- Détermination expérimentale de h et l très délicates
  $\Rightarrow$ Utilisation des équations d'état
  et Relations de Clapeyron (appel à dU, dS, dH, dG, etc, qui seront présentés plus tard)

$$l = T\left(\frac{\partial P}{\partial T}\right)_V \qquad \left(\frac{\partial c_V}{\partial V}\right)_T = T\left(\frac{\partial^2 P}{\partial T^2}\right)_V \qquad c_P - c_V = -T\frac{\left(\frac{\partial V}{\partial T}\right)_P^2}{\left(\frac{\partial V}{\partial P}\right)_T}$$

$$h = -T\left(\frac{\partial V}{\partial T}\right)_P \qquad \left(\frac{\partial c_P}{\partial P}\right)_T = -T\left(\frac{\partial^2 V}{\partial T^2}\right)_P$$

Relation de Robert Mayer

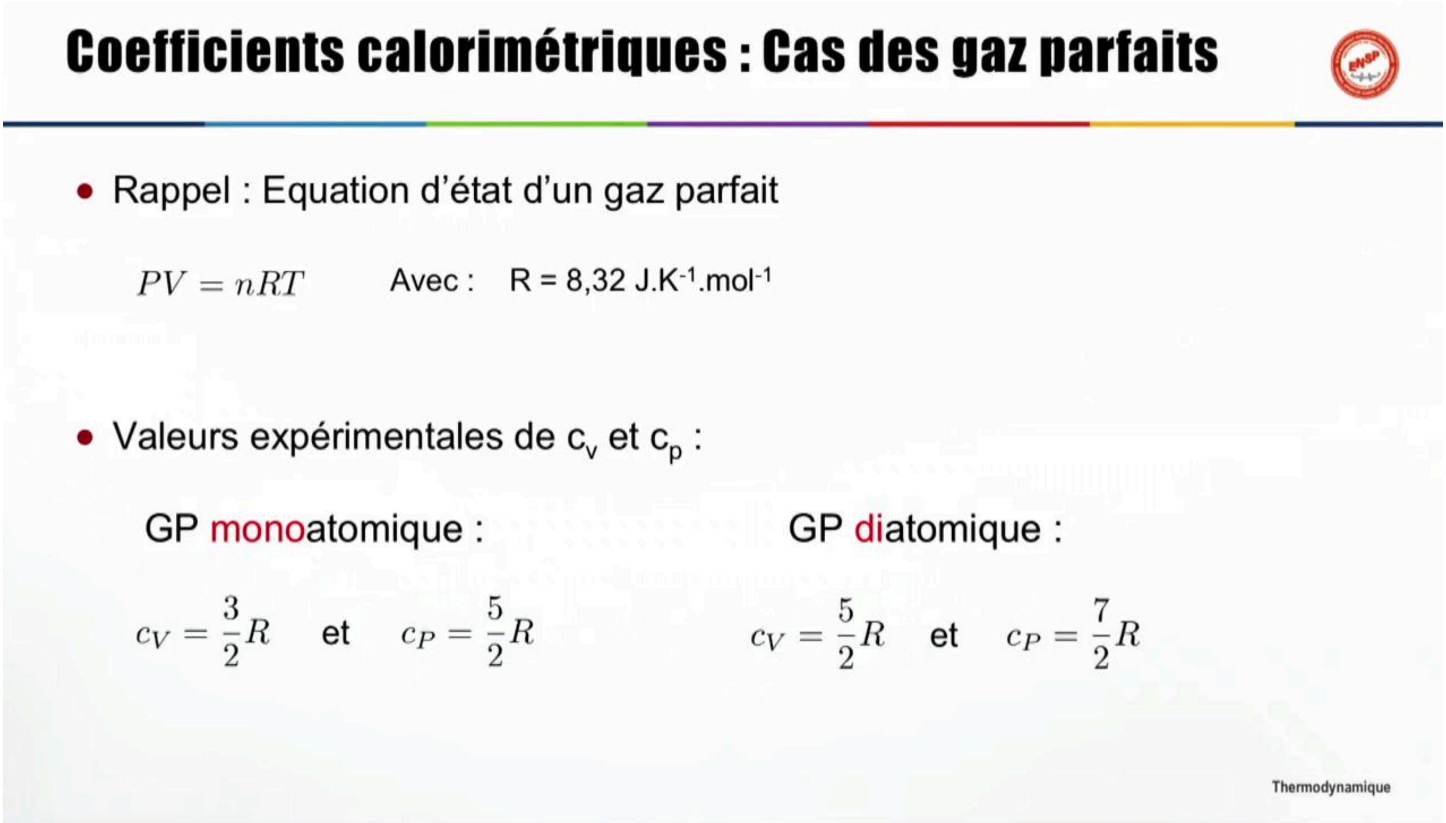
Thermodynamique

The second derivative was to bring a plus without a constant. This is the case for the full classroom. They are used for the determination of eunuchs within Taman and they. But Robert Maillet's connections and relationships, Kelly, CP and CB to find out if he had been on the climb. The ratio of derivatives went from again set to the DVD in relation to the constant temperature printing. That's it. Relationships that are used. After one has known the values of the CP and has risen from the mental point of view. We will now determine. Carlos' cousin, the mute. In the particular case of perfect gases.

Notes

Summary

4m 04s

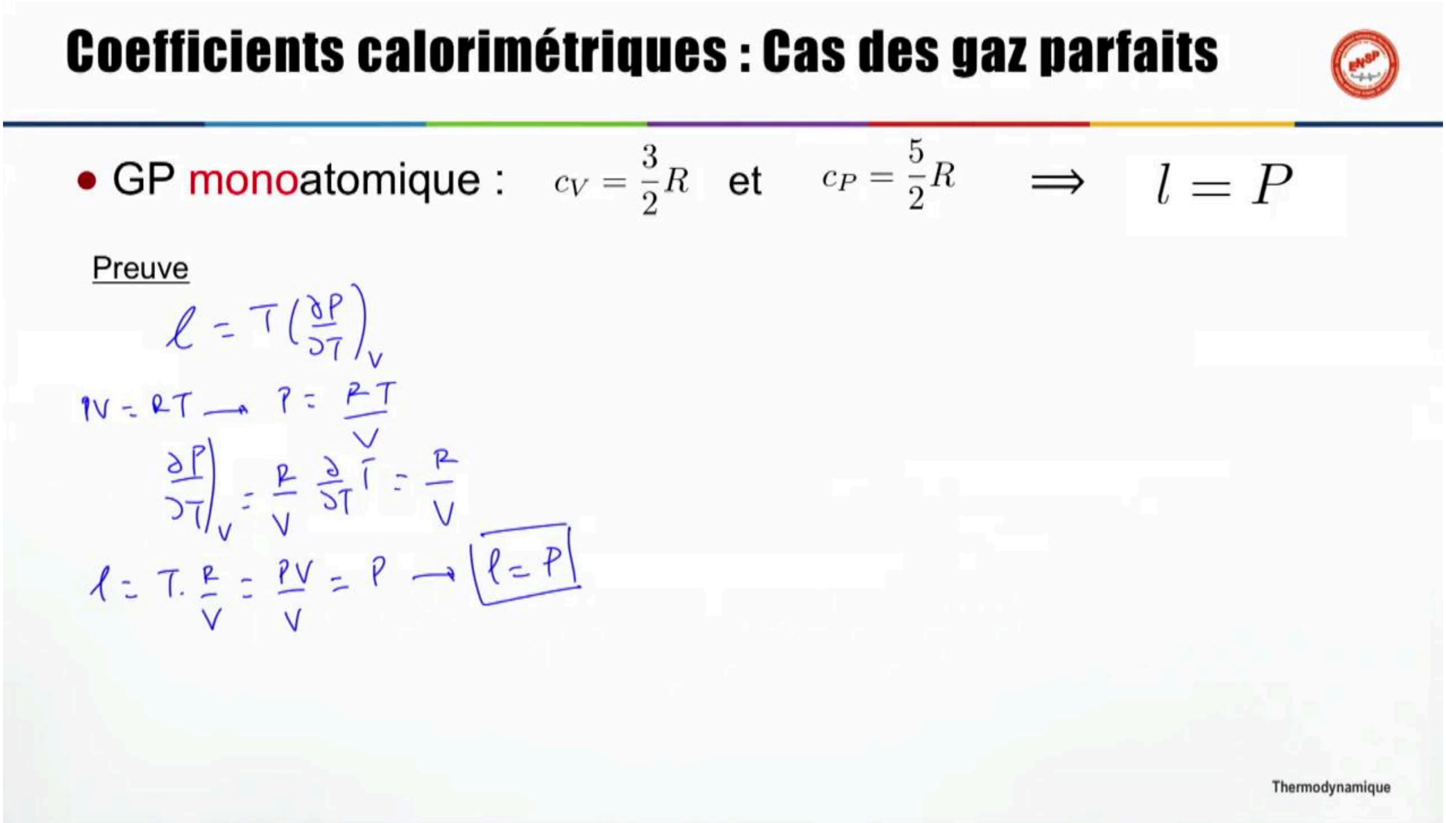


But a little reminder, namely that a perfect gas characterized by the equation is equal to a summer with and at the console is at this level about 1,000.32 days per mole. What is the number of moles? And had been on the roofs when she was the good declassified lady we know. Let's also remember the mental sluggishness of CVs and CPs. They are directly related. The planted consonant, the following way. And we will make a distinction between a mono atomic gas and a perfect gas called atomic. Problem thanks to an atomic fire. We obtain experimentally that cv is equal to three F and it is the end of L. For a perfect diatomic gas, cv is rather of r and cp seven half of R. Damien Abad remembers We will determine the other colorimetric coefficients, so we take the particular case of an atomic gas.

Notes

Summary

4m 57s

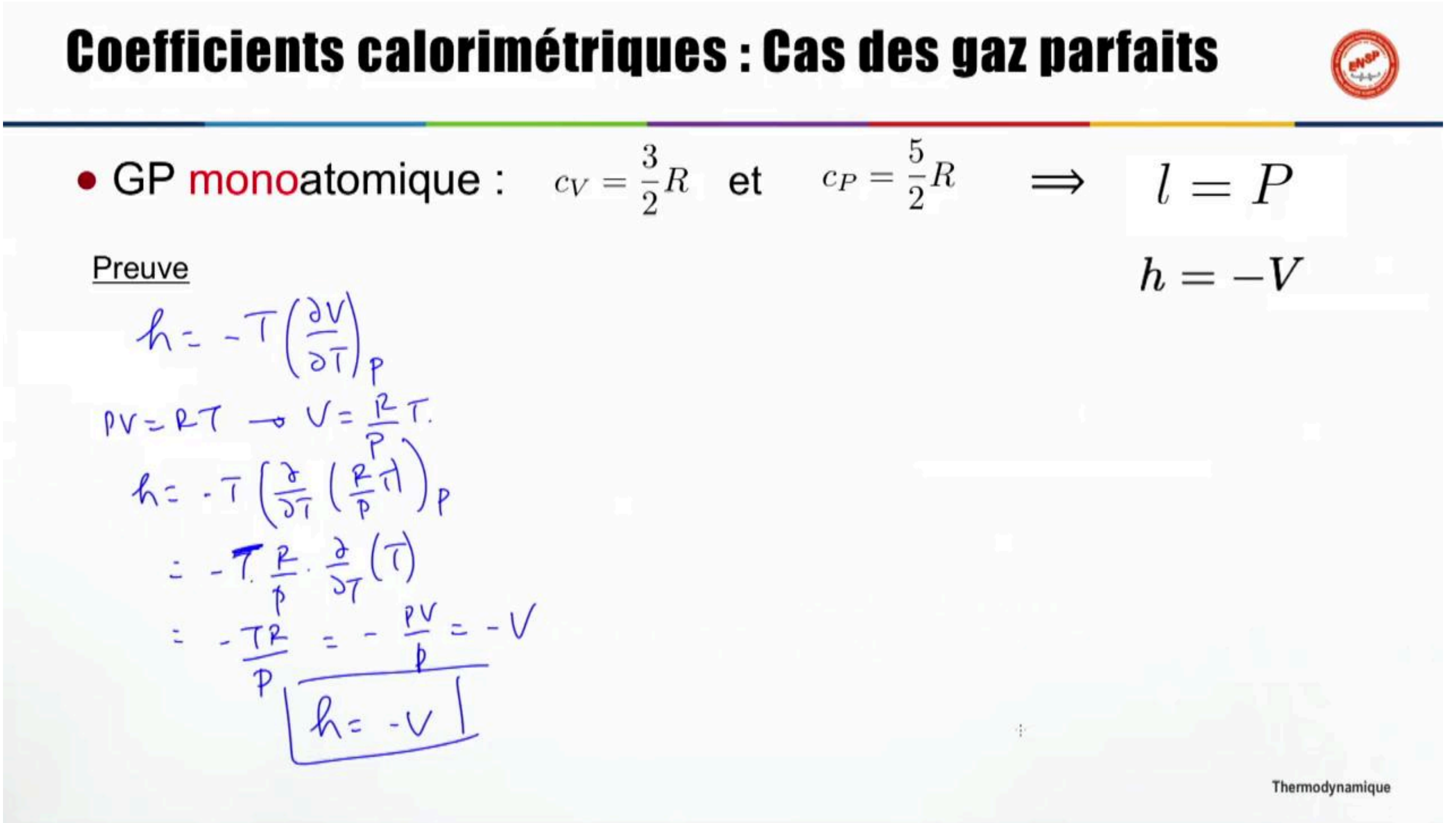


We are reminded here of the mental health in these essays by R. The first relationship. And that therefore it is equal to the pressure of the gas. Indeed. They determined and had to later develop the peace at constant volume. With the perfect gas equation PV equals LT. We will place ourselves in the case of a ball. We can also help Silver. This allows us to obtain the derivative of P with respect to a constant volume in the volume and in constant is and V are constant with respect to d of t which is one. This drift is equal to the followed. It comes in the ? And Galatea multiplies the pips. At the same time failed, that is to say it survives. And the call to the fish of the perfect gas, etc. The PV of which the AFP had raised a simple green light. So we have little water, it was suitable. We find that. The same lesson will be obtained for the case of a diatomic gas. This will not intervene here, neither CBV nor CP. Very good.

Notes

Summary

6m 07s

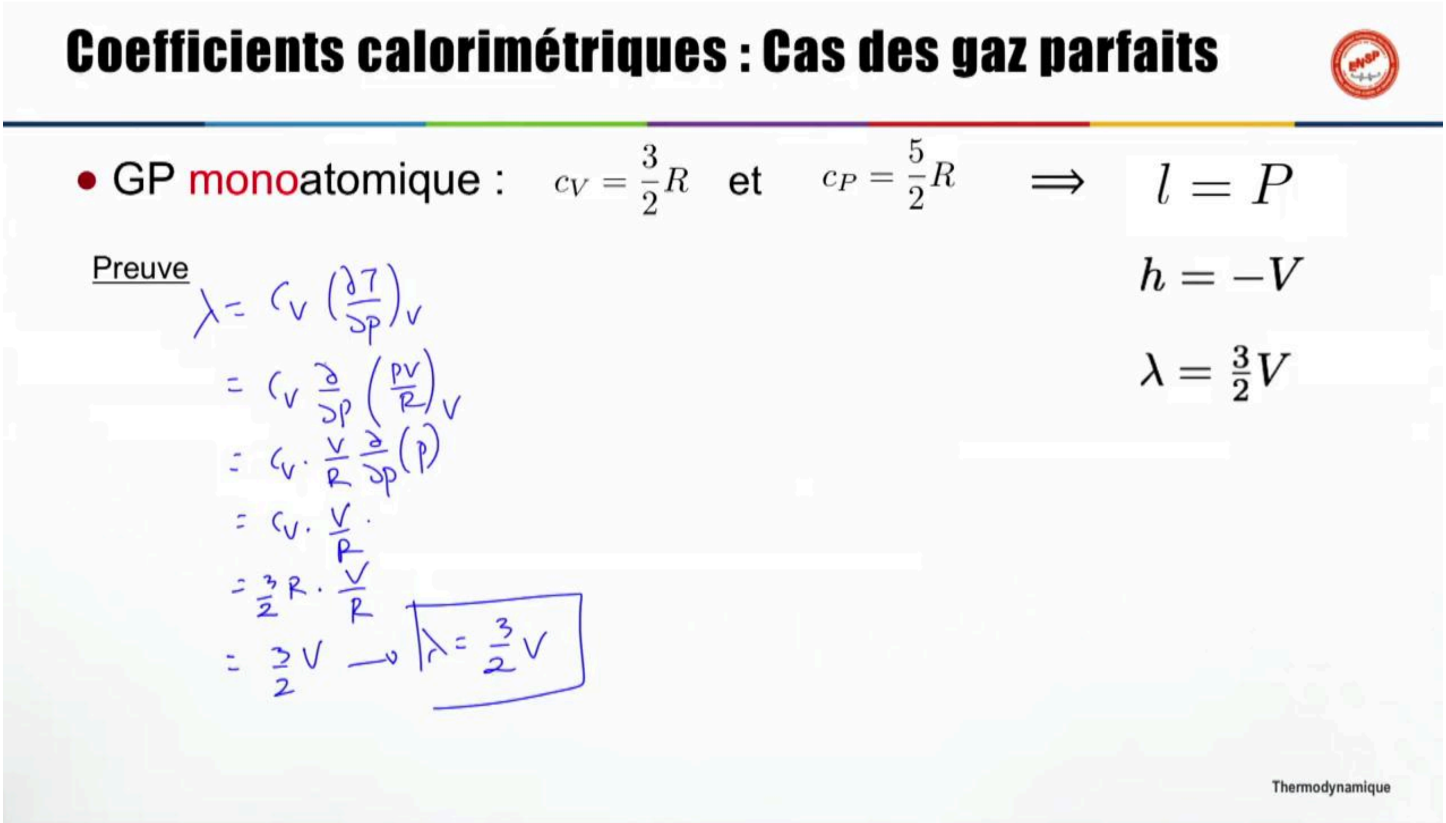


The second equality concerns the quotient H and we show that H was in the mean V. We are in the case of a mono atomic gas. Indeed. H has been defined as me nt has been established as me. NT develops to that of V bring a plus, a constant. The equation of the perfect gas PV equal to LT, we deduce v is equal to n. Juppé whipped. In Ace was to the rise that multiplies. Derivatives within the reach of LCP. T. One more constant that to dismantle. B is inconstant and is super constant in the DB esp soil. One gives high in relation to t of the valid is equivalent to the rise on supp and is still equal to the PV of C7 equal to minus PV supp. And when it does not make p, we have less V. So pretty well equal to minus V. And there, we notice, as the fact that in this demonstration, of the CPC values have not occurred. We also go for a perfect diatomic gas. The same modulation is equal to minus V. The next coefficient is the mythical. This. Landa. And it is shown that for the atomic gas.

Notes

Summary

7m 39s

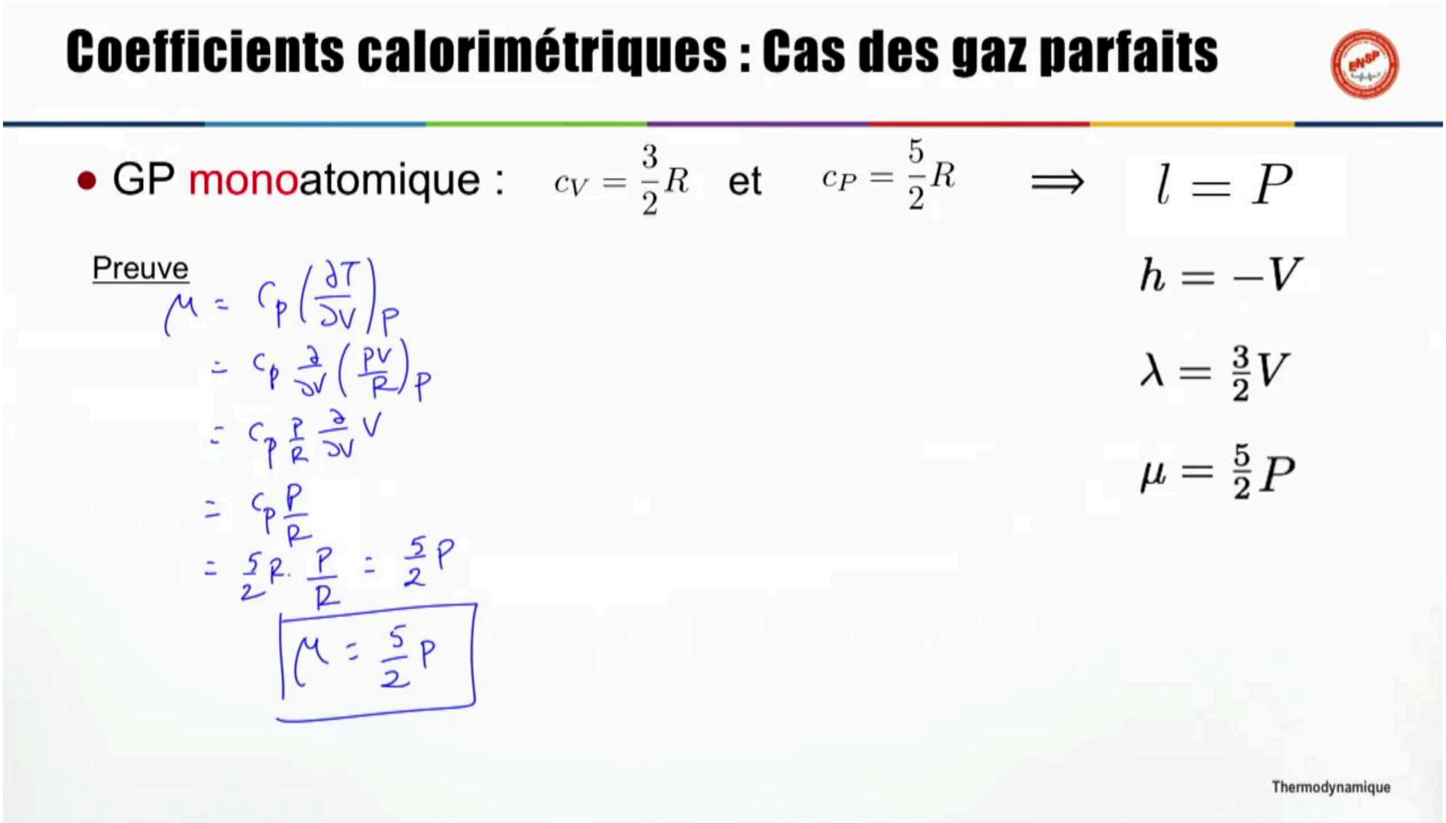


Lamda is equal to three half of V. Indeed. It was established in the NVC and was not there to buy a constant volume. Or with the help of water with the perfect gas equation. We have tickets. Super constant volume. The volume is inconstant so vs are constant in a stroke. That multiplies. V and R. And this is the parenthesis derived from cell A1 of P. One has in these vehicles multiplied V follows and multiplies one now cv. In the case of a good atomic air gas, we tried to MEDEF. That multiplies. Visual and simplifying. With Air, we now also have three half lifts, i.e. lambda. In the canvas of. Should we expect here that. The expression used is that of these three halves. So when we have a diatomic gas. A pan lit without letting go, says Demi Gala. This is the beginning of V. The fourth mileage coefficient is set.

Notes

Summary

9m 16s

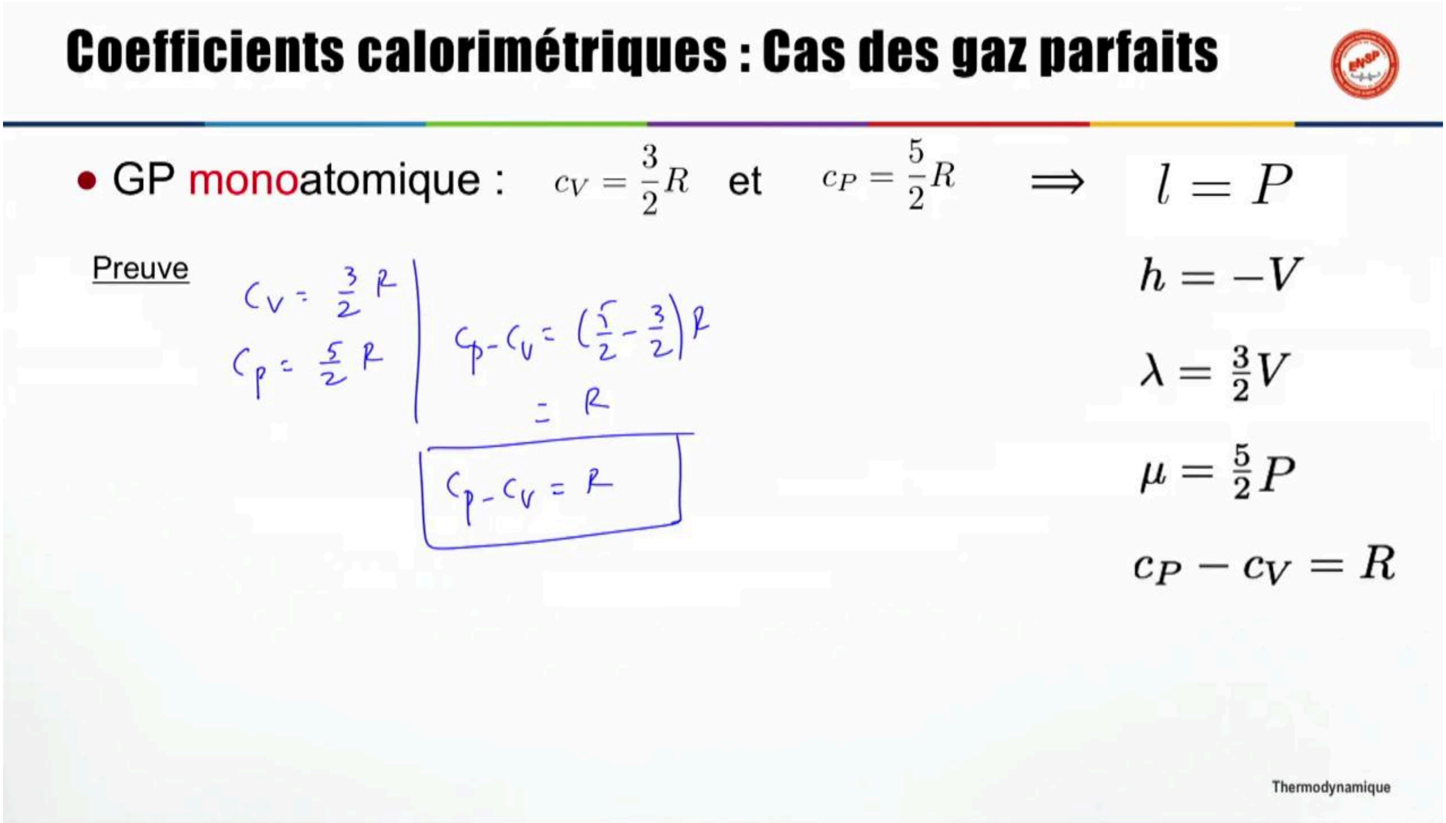


And for a perfect gas, my atomic, my life is shown to be equal to that of P.'s friends. Indeed. We got it all in the middle. In DCP form. DVD compared to V. At constant pressure, it is at DCMP. Des. Was there, the PV you are in the derivative in relation to had PV. It is a powerful accountant, it does not make C.P. P. P. It is an outgoing consonant in the derivation. We have derived with respect to v from V which gives us a rather thick interval. P suis f. But this is the Medef scene. One asserts here struck on TF one, simplifying. With the R, we get. This is the beginning of peace. The UN was at the end of 1000. DP and we see in this demonstration. That it is not used. And Vossen is for diatomic gas. It is P is equal to this half. It was no longer held equal to this half of P. Good. Relationships that we will verify in the b-states for the perfect gas, it is the law of Robert Maillard.

Notes

Summary

10m 58s

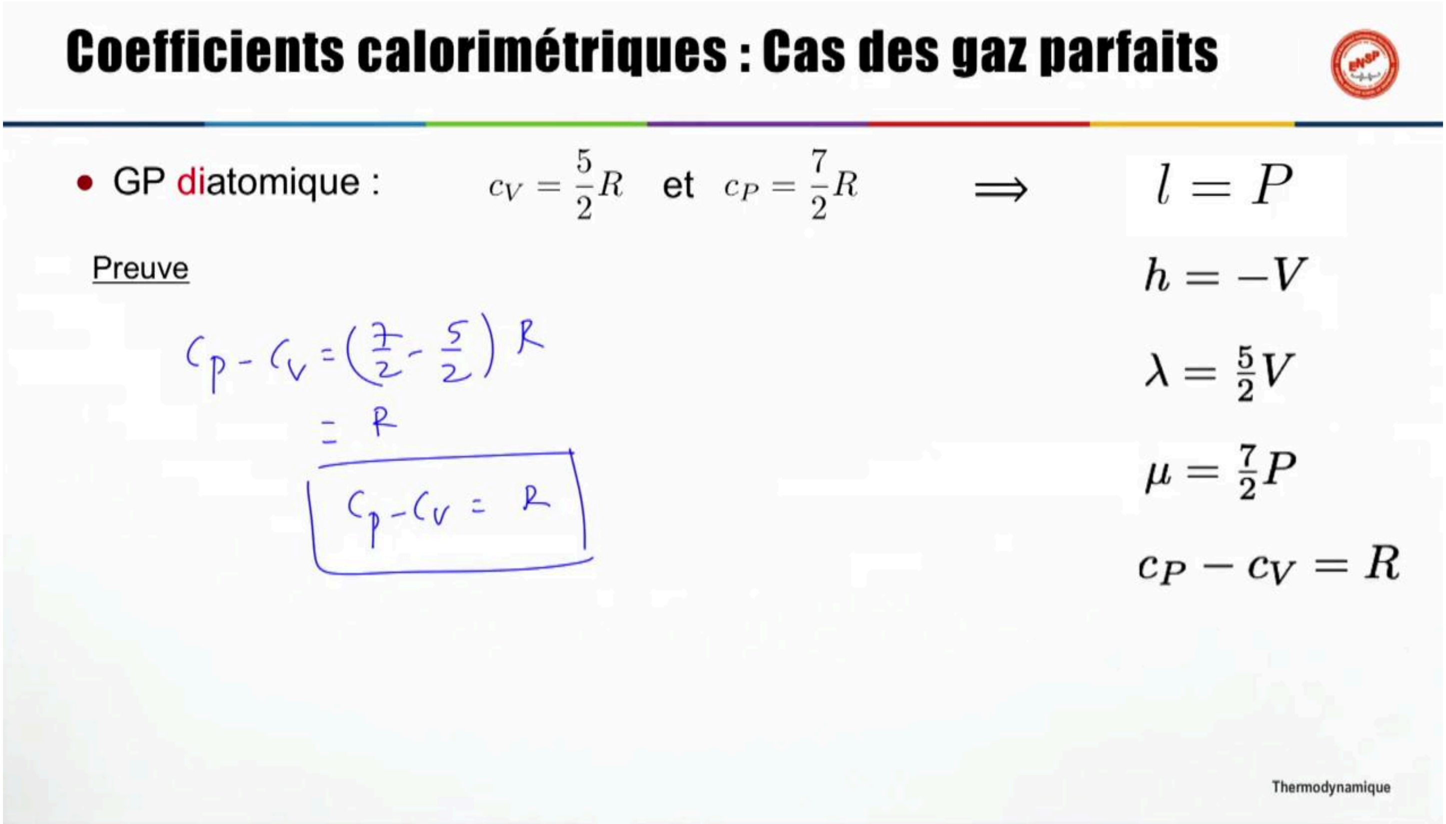


And it is shown that Plougastel was educated at the R. Indeed. This is V equal to three half of R. CFP, equal to that of R. It was said clearly C.P. Raised in Saint-Denis. Less than three halves of R. It's a spanking to half-breeds. That makes two half brothers of OCP and I rose to the R. Robert's sister, a gas mother, made me. The pointed out that. For a perfect diatomic gas, this is true. Your five CPR halves have millennia, they were going to do decades more. So for a perfect gas, we have atomic the relationships that are there, that give in and guys peace to those guys there minus V, but the half scene of P. And these guys, she. For Lynda, it is diatomic.

Notes

Summary

12m 33s

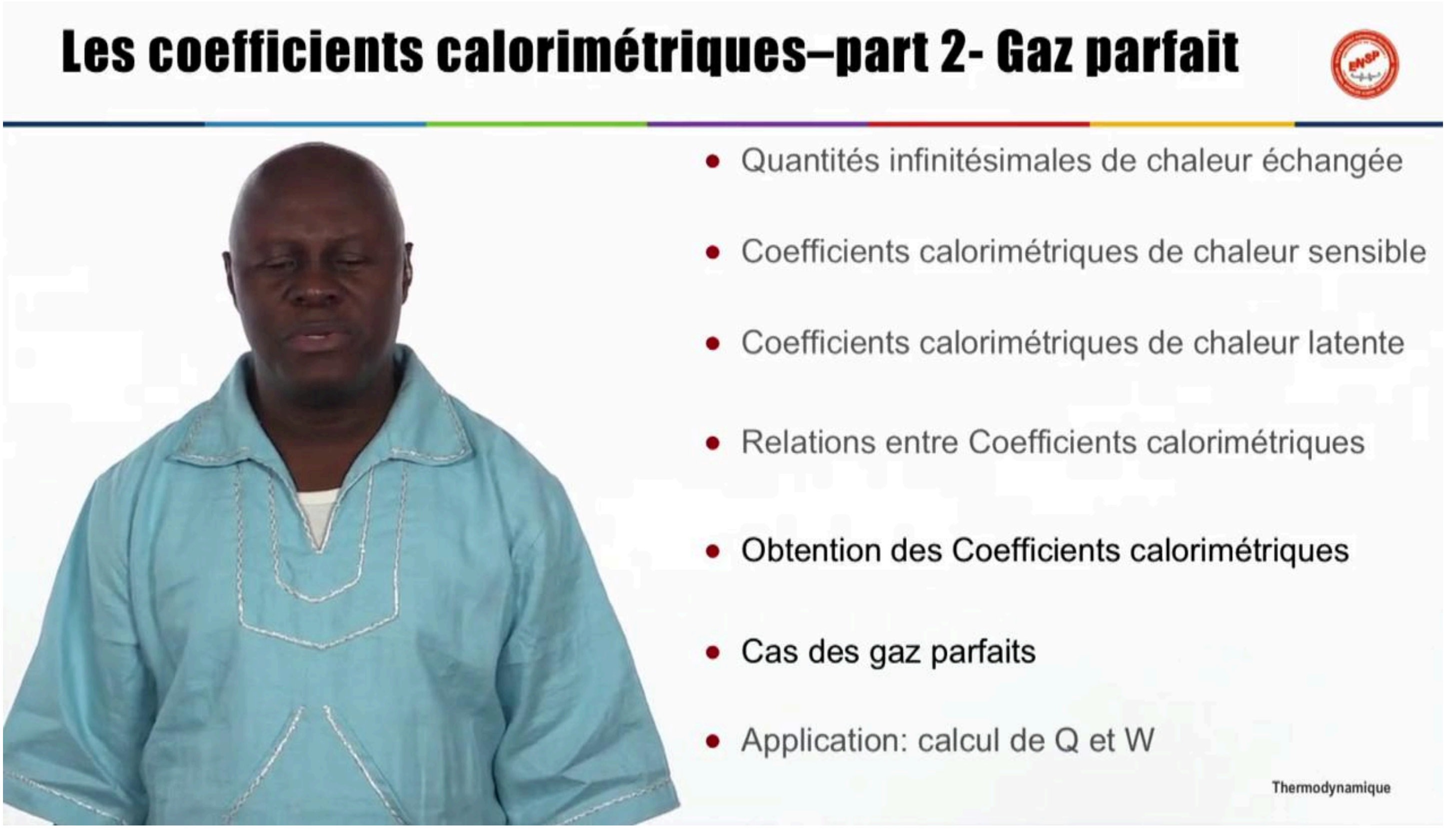


The demonstrations are done in the same way way, but we take into account that it is a half CP equal to this half. So we go up. Perhaps it is to the peace. In the same way as. In the case of a perfect atomic gas, especially because the coefficient is many do not intervene, as well as HT at the minus V because of the same reasons. Now for the case of Lamda Look Official who was speaking earlier. In the note to Lambda, we move to an equation of the form lambda equal high enough that multiplier is. In the case of a perfect gas. Diatoms Silver Valentine Demers, Dr. We escaped from a palace and we, at the end of my life had to. Very good. The second one about even. We have half of peace in reality. Just like with gas, my atomic, we have the general evaluation of the form, but equal to CP. P. R. And taking into account that Diatomic CPT to the half suite of R. We have been elected to the Academy since. And the relationship that it has without doubt the same is also evident. It is obvious, at the end of this half, we have a new resume equal to that of MIT of l me is a half of F which gives us wings. And Galatea?

Notes

Summary

13m 42s



In conclusion of this lesson, we say that. After. Go up. How to obtain the colorimetric quotient, including CP, CB experimentally and other deduced coefficients of Clapeyron's relations and the best? We did not admit. We then applied expression differences to the perfect gas, which allowed us to obtain, at least for the perfect gas, the different computer codes. The rest of our. The sound will focus on the Application module. We will apply everything we have seen in this practice. For the business of determination, of exchanging heat, tables exchanged between the system and the external environment. This is a milestone. Focusing more on gas perfect which we have been able to at least persist until now. The cousin of Carlos, the mythical one. Thank you for your patience. Thank you for your attention. We hope to have with us. Prussian style on 100.

Notes

Summary

15m 47s