A NEW TYPE OF GAS-STEAM TURBINE CYCLE

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Structure of Presentation

Introduction

Technological scheme

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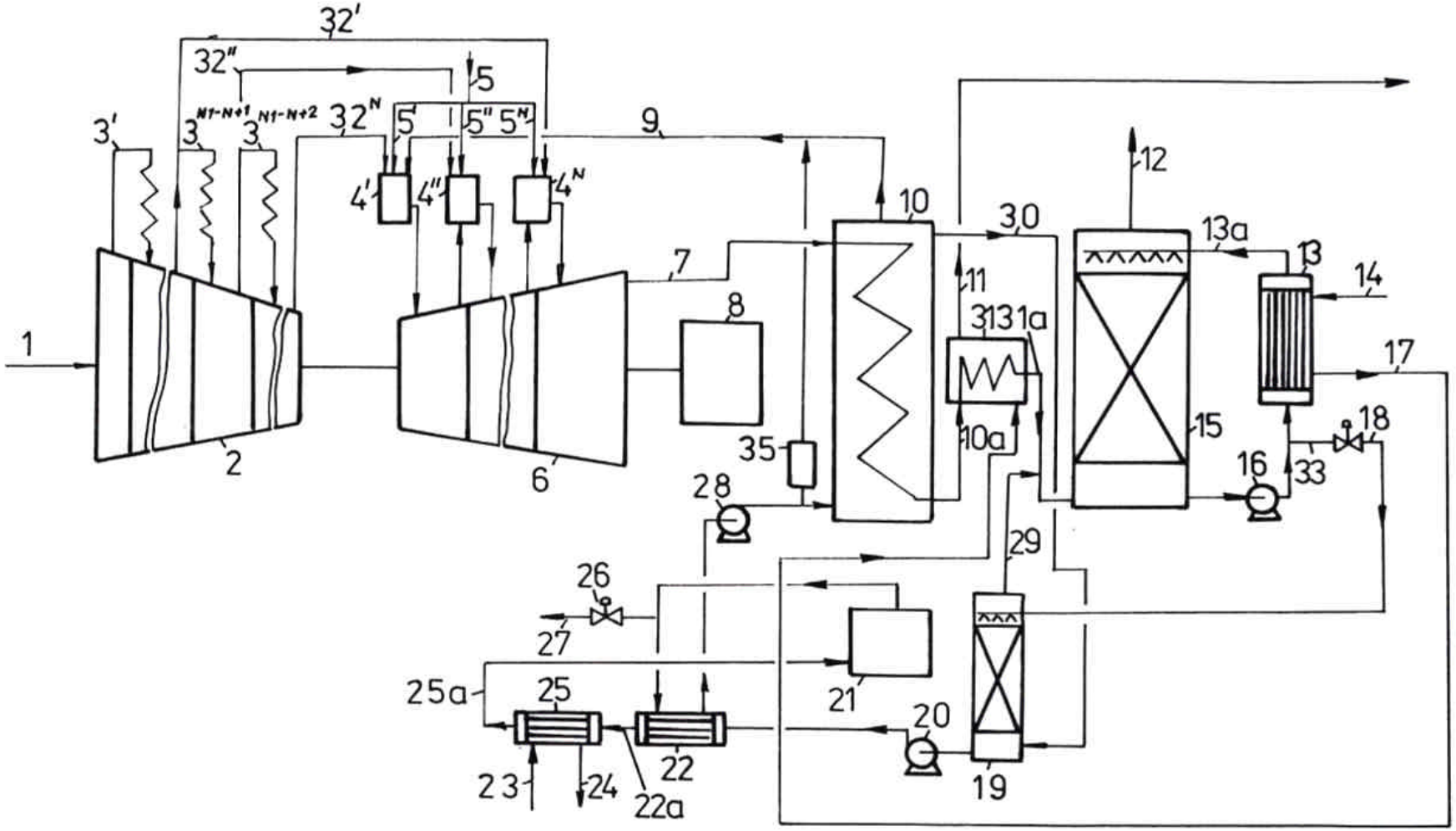
Summary and conclusions

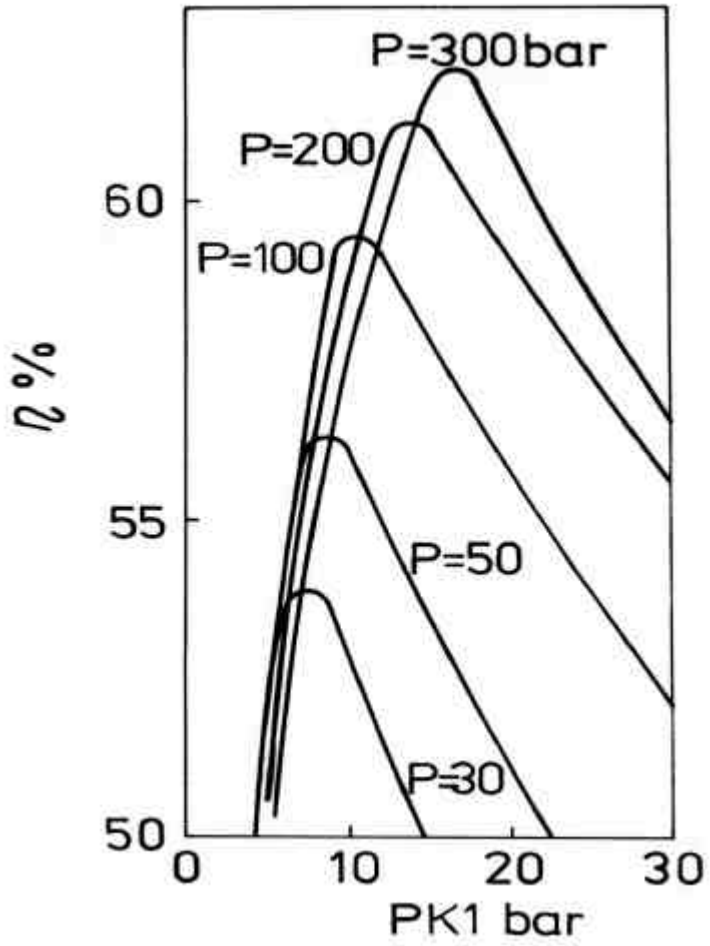
Technological scheme



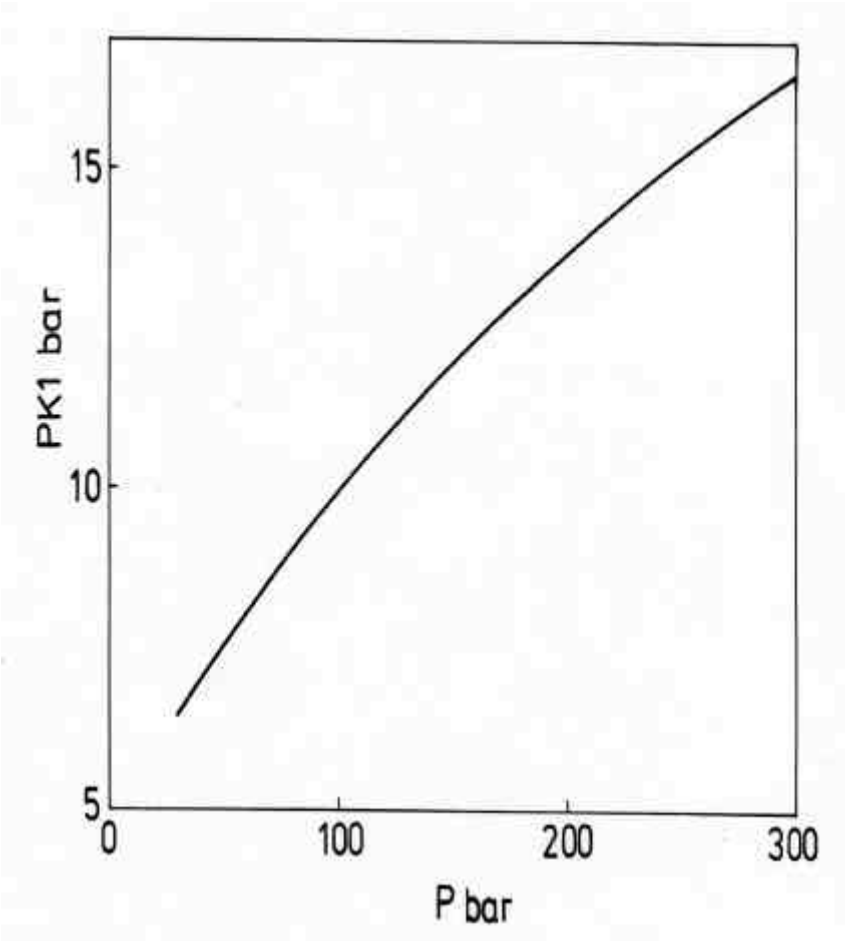
Range of the parameters

Parameter	Value
Inlet pressure in the turbine	30-300 bar
Calculating inlet temperature in the respective stage of the gas-steam turbine	1000-1200^{o}C
Internal efficiency of the turbine and compressor	0.85
Inlet pressure in the last stage of the turbine	5-30 bar
Coefficient of air excess	1-2
Minimal local temperature difference in boiler 10 (Fig.1)	60^{o}C
Air temperature at the compressor inlet	20^{o}C
Outlet temperature of the heat exchangers 3b	65^{o}C

Results

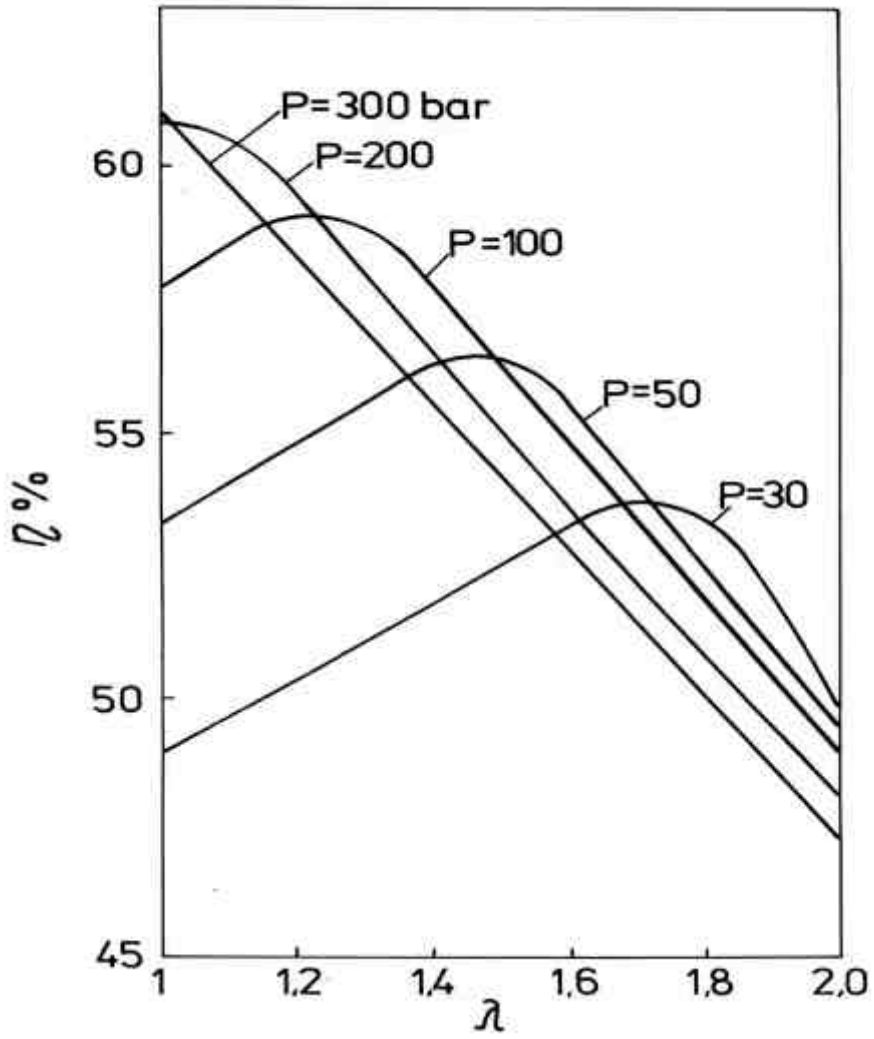


Relationship of the thermodynamic coefficient of mechanical efficiency of the installation as a function of the inlet pressure in the last turbine stage (PK1) at different turbine inlet pressure, P. tt=1200oC, l = 1, N=6.



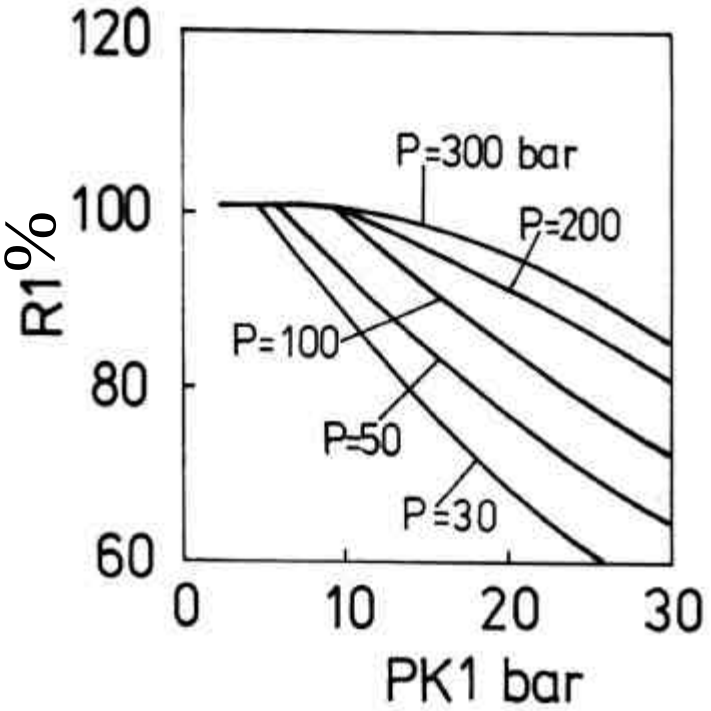
Relationships of the optimal value of PK1 of the installation as a function of the initial pressure P .

Results

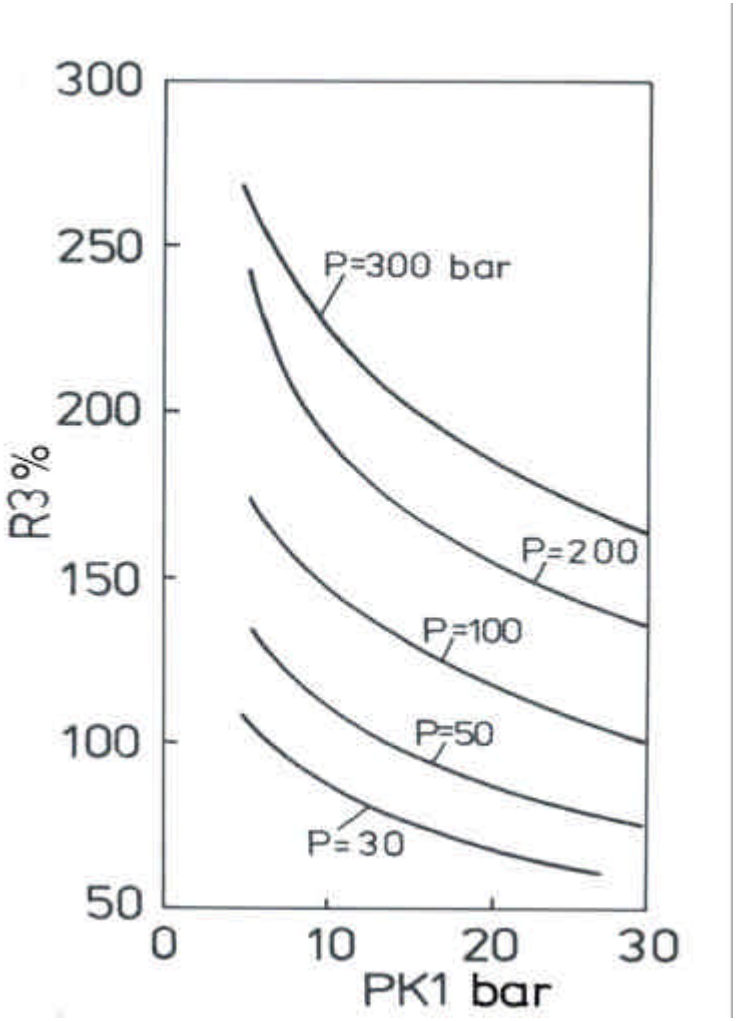


Coefficient of mechanical efficiency of the installation versus the coefficient of air excess λ at different initial pressure at the turbine inlet. .

Results

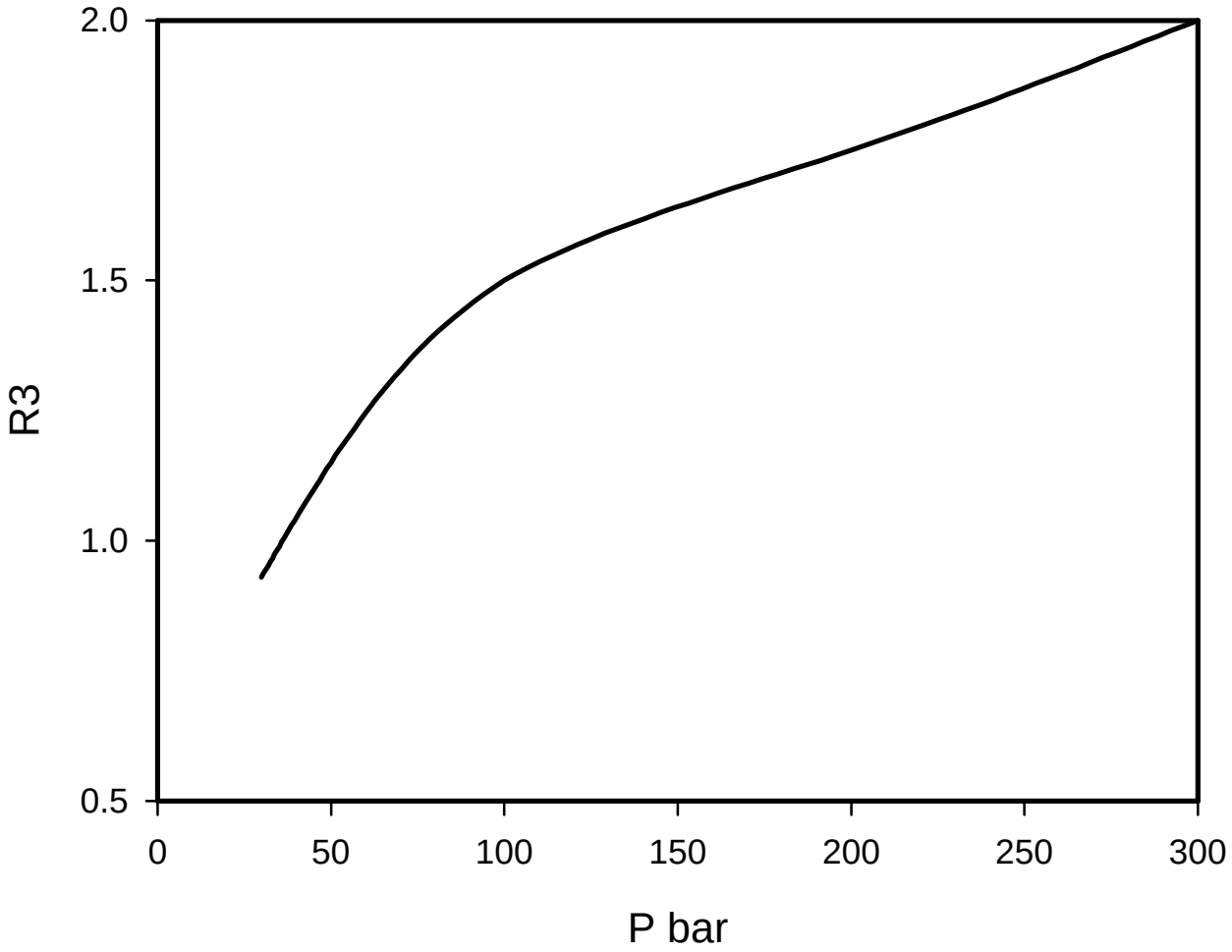


Ratio R1 versus PK1 Ratio R1 versus PK1



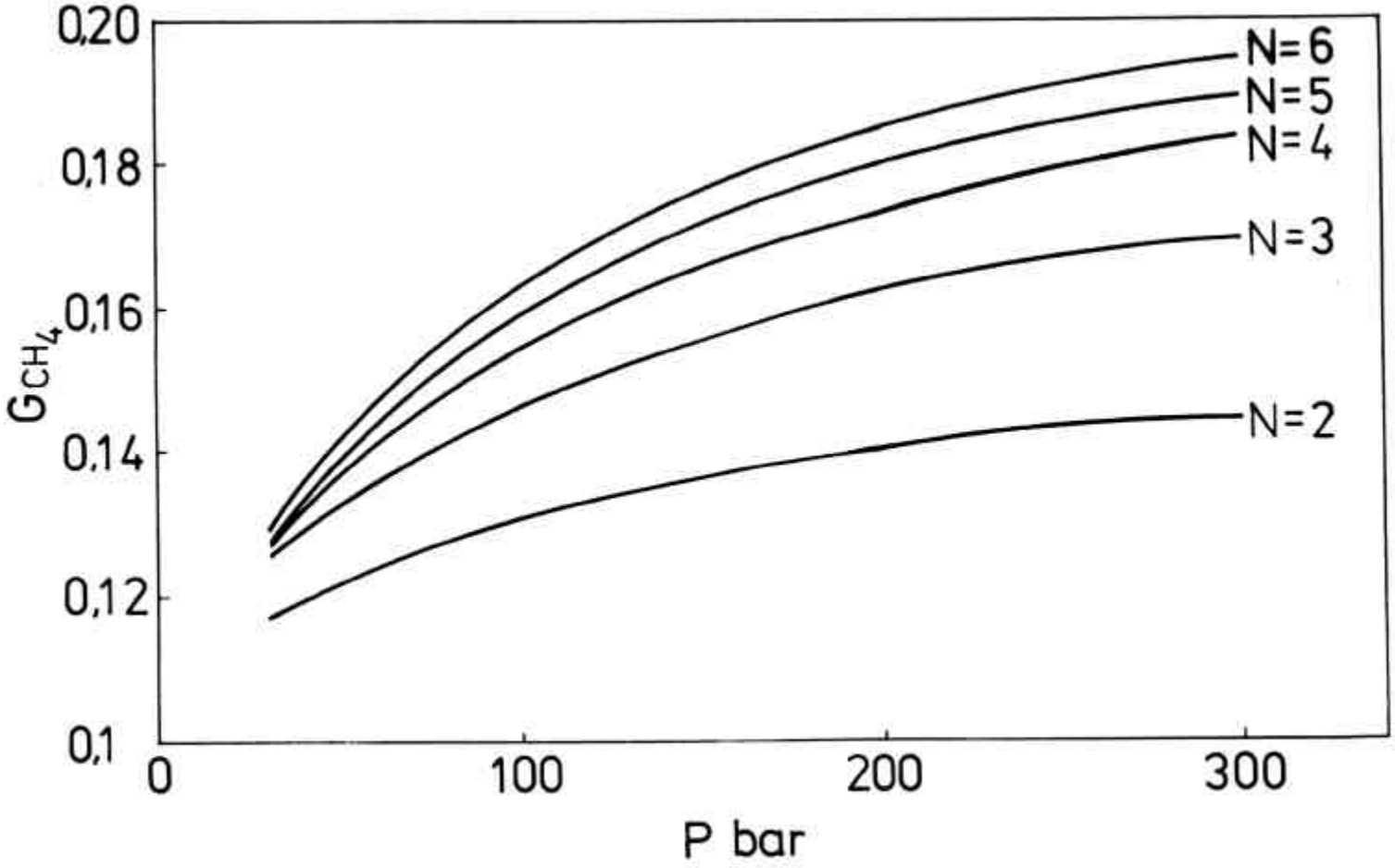
Ratio R3 versus PK1.

Results



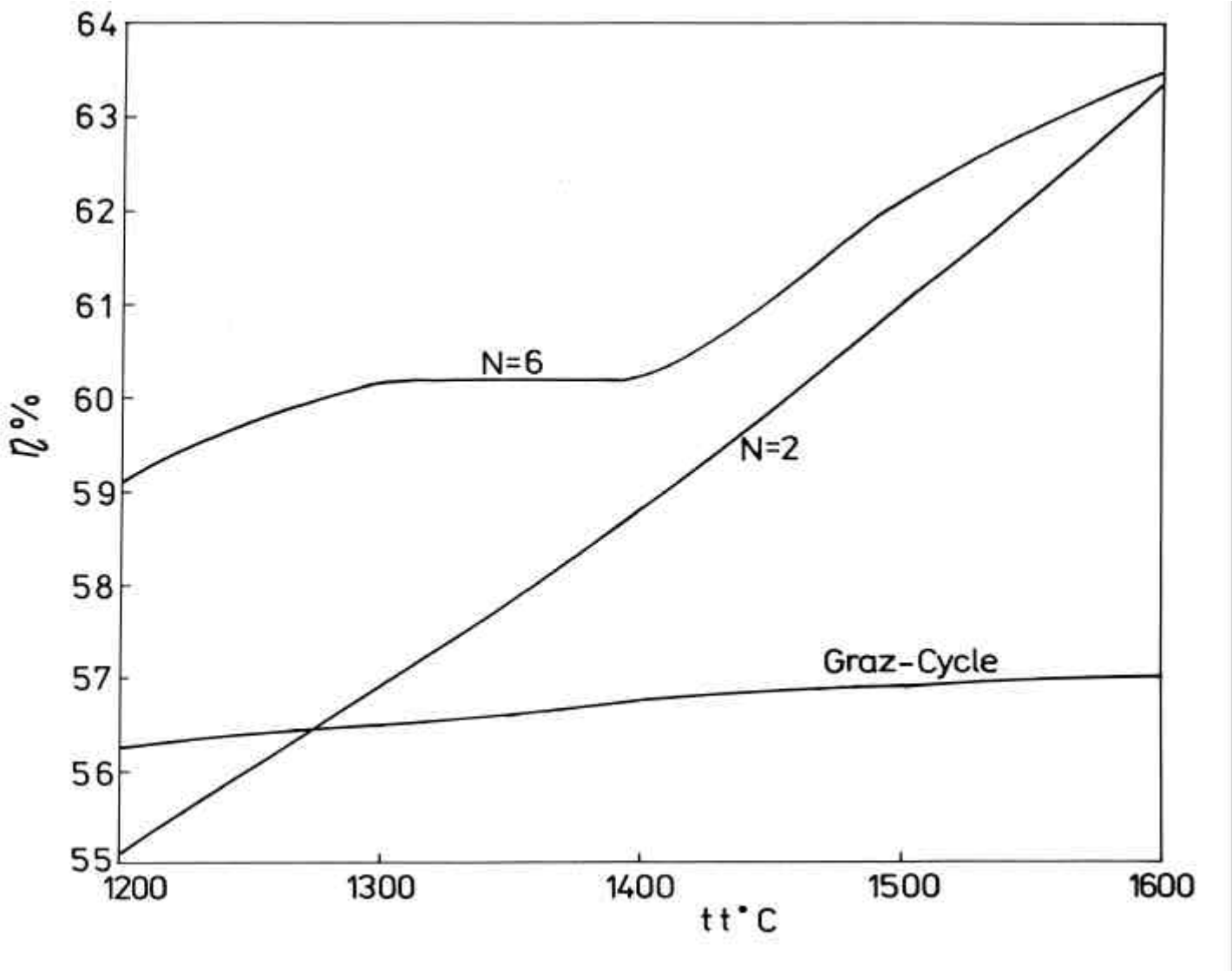
Ratio of R3 versus initial pressureP.

Results



Ratio of G_{CH4} versus P. N= 6, tt= 1200oC, l = 1.

Efficiency comparison with the Graz cycle



Comparison of the coefficient of mechanical efficiency of the new installation with the Graz cycle at internal efficiency of the turbine and the compressor respectively 90 and 86%. P =50 bar, l = 1.