

Aufgabe 1

$$a) \dot{Q} = m_{\text{kw}}(h_{\text{ein}} - h_{\text{aus}}) + Q_{\text{aus}}$$

$$Q_{\text{aus}} = m_{\text{kw}}(h_{\text{aus}} - h_{\text{ein}})$$

$$= m_{\text{kw}} [c(T_{\text{aus}} - T_{\text{ein}}) + v^{\text{if}}(p_{\text{aus}} - p_{\text{ein}})]$$

$$b) T = \frac{\int_e^a T ds}{S_a - S_e} = \frac{q_{\text{rev}}}{S_a - S_e} = \frac{h_{\text{aus}} - h_{\text{ein}}}{S_{\text{aus}} - S_{\text{ein}}} = \frac{f(T_{\text{aus}} - T_{\text{ein}}) + v^{\text{if}}(p_{\text{aus}} - p_{\text{ein}})}{f \ln\left(\frac{T_{\text{aus}}}{T_{\text{ein}}}\right)} = 0$$

$$= \frac{T_{\text{aus}} - T_{\text{ein}}}{\ln\left(\frac{T_{\text{aus}}}{T_{\text{ein}}}\right)} = \frac{298.15K - 288.15K}{\ln\left(\frac{298.15K}{288.15K}\right)}$$

$$= \underline{\underline{293.12K}}$$

~~Ex Entropiebilanz:~~ ~~\dot{Q}_{aus}~~ ~~\dot{S}_{erz}~~

$$c) \text{Entropiebilanz: } \dot{Q} = + \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{KF}}} + \dot{S}_{\text{erz}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{reaktor,1}}} + \dot{S}_{\text{erz}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{KF}}}$$

~~$\dot{S}_{\text{erz}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{reaktor,1}}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{KF}}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{KF}}} + \frac{\dot{Q}_{\text{R}}}{\bar{T}_{\text{reaktor,1}}} = \frac{65'000W}{295K} + \frac{100'000W}{372.15K}$~~

$$\dot{S}_{\text{erz}} = \frac{\dot{Q}_{\text{aus}}}{\bar{T}_{\text{KF}}} + \frac{\dot{Q}_{\text{R}}}{\bar{T}_{\text{reaktor,1}}} = \frac{65'000W}{295K} + \frac{100'000W}{372.15K}$$

$$= \underline{\underline{47.64 \frac{W}{K}}}$$

$$d) \frac{dE}{dt} = \sum_i [h_i + \dot{p}_{ki} + \dot{K}_{ki}] - \dot{Q} - \dot{W}$$

$$\Delta U = \Delta m_{12} h_{\text{ein}} + \dot{Q}$$

$$m_2 u_2 - m_1 u_1 = \Delta m_{12} h_{\text{ein}} + \dot{Q} \quad m_2 = m_1 + \Delta m_{12}$$

$$(m_1 - \Delta m_{12}) u_2 - m_1 u_1 = \Delta m_{12} h_{\text{ein}} + \dot{Q}$$

$$-\dot{Q} - m_1 u_1 = \Delta m_{12} h_{\text{ein}} - m_1 u_2 - \Delta m_{12} u_2$$

$$-\dot{Q} + m_1 (u_2 - u_1) = \Delta m_{12} h_{\text{ein}} - \Delta m_{12} u_2$$

$$-\dot{Q} + m_1 (u_2 - u_1) = \Delta m_{12} (h_{\text{ein}} - u_2)$$

$$\Rightarrow \Delta m_{12} = \frac{m_1 (u_2 - u_1) - \dot{Q}}{h_{\text{ein}} - u_2}$$

siedende Flüssigkeit $\Rightarrow x = 0.5$

$$h_{\text{ein}} = 83.96 + 0.5(2538.1 - 83.96) = 1311.03 \frac{\text{kJ}}{\text{kg}}$$

TAB-A-2

$$u_1 = 418.94 + 0.005(2506.5 - 418.94) = 429.3778 \frac{\text{kJ}}{\text{kg}}$$

TAB-A-2

$$u_2 = 292.95 + 0.5(2469.6 - 292.95) = 1381.275 \frac{\text{kJ}}{\text{kg}}$$

TAB-A-2

$$\Delta m_{12} = \frac{5755 \text{ kg} (1381.275 \frac{\text{kJ}}{\text{kg}} - 429.3778 \frac{\text{kJ}}{\text{kg}}) + 3500 \text{ kJ}}{1311.03 \frac{\text{kJ}}{\text{kg}} - 1381.275 \frac{\text{kJ}}{\text{kg}}}$$

e) ~~Entropie~~

$$e) \text{ Entropiebilanz: } \frac{ds}{dt} = m_{\text{ein}} \cdot s_{\text{ein}} - \frac{G_{\text{aus},12}}{\bar{T}_j} + \dot{S}_{\text{erz}} (+)$$

$$\Delta S = m_2 s_2 - m_1 s_1$$

$$m_2 = m_1 + \Delta m_{12} = 5755 \text{ kg} + 3600 \text{ kg} = 9355 \text{ kg}$$

$$s_2 = 0.9349 + 0.5(7.7553 - 0.9349) = 4.3551 \frac{\text{kJ}}{\text{kg K}}$$

TAB-A2

$$s_1 = 1.3069 + 0.005(7.3549 - 1.3069) = 1.33714 \frac{\text{kJ}}{\text{kg K}}$$

$$\begin{aligned} \Delta s_{12} &= 9355 \text{ kg} \cdot 4.3551 \frac{\text{kJ}}{\text{kg K}} - 5755 \text{ kg} \cdot 1.33714 \frac{\text{kJ}}{\text{kg K}} \\ &= 33046.7 \frac{\text{kJ}}{\text{K}} = \underline{\underline{33.05 \frac{\text{MJ}}{\text{K}}}} \end{aligned}$$

and the state's role in the provision of health care services. In this article, we examine the relationship between the two.

We begin by examining the historical development of Medicaid and the growth of state involvement in health care delivery. We then turn to the question of whether Medicaid has increased state involvement in health care delivery. Finally, we conclude by discussing the implications of our findings for the future of Medicaid.

THE HISTORY OF MEDICAID AND STATE INVOLVEMENT IN HEALTH CARE DELIVERY

Medicaid was established in 1965 as part of the Social Security Act. It was designed to provide health care coverage to low-income individuals who did not qualify for other forms of public assistance. The program was initially limited to pregnant women, children under age 18, and the elderly. Over time, however, it has been expanded to cover a wide range of low-income individuals, including disabled persons and low-income families with dependent children.

The creation of Medicaid was a significant event in the history of health care delivery in the United States. It provided a new source of funding for health care services, and it helped to expand access to care for low-income individuals. However, the program also raised concerns about the potential impact of state involvement in health care delivery.

One concern was that the expansion of Medicaid would lead to a shift in the focus of state government from other areas of public welfare to health care delivery. Another concern was that the program would encourage states to rely too heavily on federal funds, which could limit their ability to make decisions about how to use those funds.

Despite these concerns, Medicaid has become an important part of the health care system in the United States. It now covers more than 50 million people, and it provides a significant portion of the nation's health care spending.

In addition to its role in providing health care coverage, Medicaid has also played a role in shaping the way that states provide health care services. For example, the program has encouraged states to develop more efficient ways of delivering care, such as managed care organizations.

Overall, Medicaid has had a significant impact on the health care system in the United States. It has provided a new source of funding for health care services, and it has helped to expand access to care for low-income individuals. However, it has also raised concerns about the potential impact of state involvement in health care delivery.

In the next section, we will examine the relationship between Medicaid and state involvement in health care delivery. We will look at how the program has changed over time and how it has affected the way that states provide health care services.

We will also consider the implications of our findings for the future of Medicaid. We will discuss the challenges that the program faces and the steps that can be taken to address them.

Finally, we will conclude by summarizing our findings and discussing the broader implications of our research for the study of health care delivery in the United States.

In the next section, we will examine the relationship between Medicaid and state involvement in health care delivery. We will look at how the program has changed over time and how it has affected the way that states provide health care services.

We will also consider the implications of our findings for the future of Medicaid. We will discuss the challenges that the program faces and the steps that can be taken to address them.

Finally, we will conclude by summarizing our findings and discussing the broader implications of our research for the study of health care delivery in the United States.

In the next section, we will examine the relationship between Medicaid and state involvement in health care delivery. We will look at how the program has changed over time and how it has affected the way that states provide health care services.

We will also consider the implications of our findings for the future of Medicaid. We will discuss the challenges that the program faces and the steps that can be taken to address them.

Finally, we will conclude by summarizing our findings and discussing the broader implications of our research for the study of health care delivery in the United States.

In the next section, we will examine the relationship between Medicaid and state involvement in health care delivery. We will look at how the program has changed over time and how it has affected the way that states provide health care services.

We will also consider the implications of our findings for the future of Medicaid. We will discuss the challenges that the program faces and the steps that can be taken to address them.

Finally, we will conclude by summarizing our findings and discussing the broader implications of our research for the study of health care delivery in the United States.

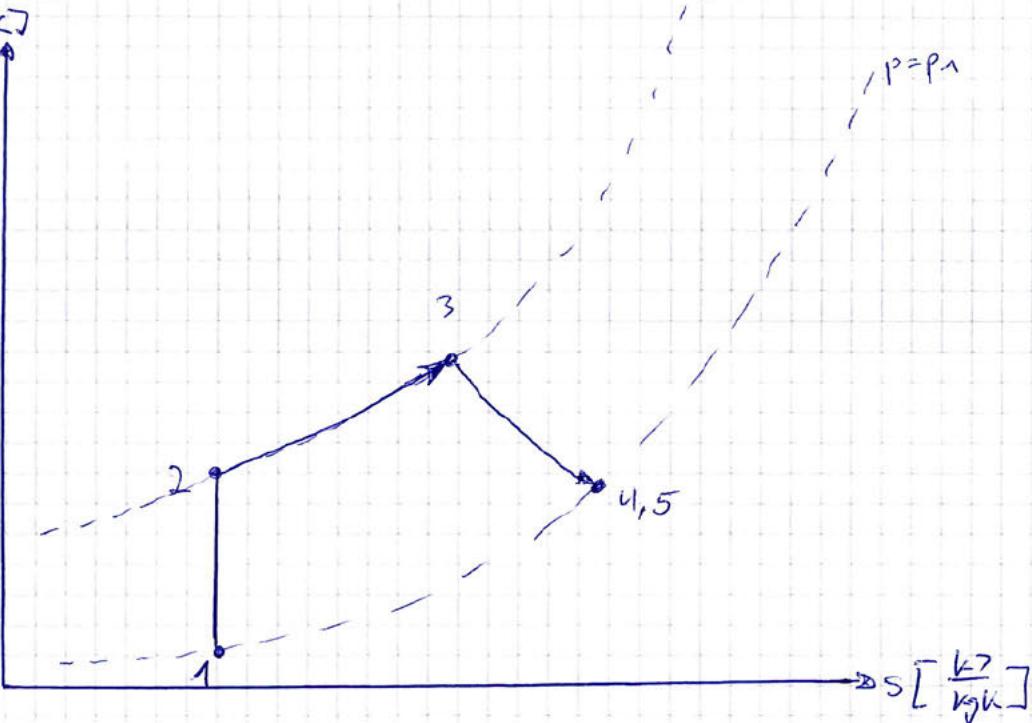
In the next section, we will examine the relationship between Medicaid and state involvement in health care delivery. We will look at how the program has changed over time and how it has affected the way that states provide health care services.

We will also consider the implications of our findings for the future of Medicaid. We will discuss the challenges that the program faces and the steps that can be taken to address them.

TKernprozessdiagramm

Aufgabe 2

a) $T [K]$



	$T [K]$	$P [bar]$	$\omega [\frac{m}{s}]$
1			
2			
3			
4			
5	431.9 K	0.5	$220 \frac{m}{s}$
6			

b) $5 \rightarrow 6$: isentrop $\Rightarrow \frac{T_6}{T_5} = \left(\frac{P_6}{P_5} \right)^{\frac{k-1}{k}} \Rightarrow T_6 = T_5 \cdot \left(\frac{P_6}{P_5} \right)^{\frac{k-1}{k}}$

$$T_6 = 431.9 K \cdot \left(\frac{0.191 bar}{0.5 bar} \right)^{\frac{0.4}{1.4}} = \underline{\underline{328.07 K}}$$

Energiebilanz: $0 = \dot{m} (h_5 - h_6 - T_0 (s_5 - s_6) + \omega \dot{e}_k) + \sum_j (-1 - \frac{T_0}{T_j}) \dot{Q}_j - \dot{W}_t - \dot{E}_{\text{Ausw.}}$

$$\dot{E}_{\text{verl.}} = T_0 \dot{S}_{\text{entz}} = 0 \quad (\text{da reversibel})$$

$$0 = m(h_s - h_6 - T_0(s_s - s_6) + \alpha k e) - \dot{W}_t$$

~~$$\dot{W}_t = \frac{1}{1-\kappa} P_2 v_2$$~~

$$\dot{W}_t = \frac{R(T_6 - T_5)}{1-\kappa} \quad (\text{ideales Gas und isentrop})$$

$$\dot{W}_t = m \cdot \omega_t$$

$$\Rightarrow 0 = m(h_s - h_6 - T_0(s_s - s_6) + \frac{1}{2}(\omega_6^2 - \omega_5^2)) - \frac{R(T_6 - T_5)}{1-\kappa} \cdot \dot{m}$$

$$\frac{R(T_6 - T_5)}{1-\kappa} = h_s - h_6 - T_0(s_s - s_6) + \frac{1}{2} \omega_6^2 - \frac{1}{2} \omega_5^2$$

$$\frac{1}{2} \omega_6^2 = \frac{R(T_6 - T_5)}{1-\kappa} + \frac{1}{2} \omega_5^2 + T_0(s_s - s_6) + h_6 - h_s$$

$$(s_s - s_6) = C_p \ln\left(\frac{T_5}{T_6}\right) - R \ln\left(\frac{P_5}{P_6}\right)$$

$$(h_6 - h_s) = C_p(T_6 - T_5)$$

$$\Rightarrow \frac{1}{2} \omega_6^2 = \frac{R(T_6 - T_5)}{1-\kappa} + \frac{1}{2} \omega_5^2 + T_0 \left[C_p \ln\left(\frac{T_5}{T_6}\right) - R \ln\left(\frac{P_5}{P_6}\right) \right] + C_p(T_6 - T_5)$$

$$\Rightarrow \omega_6 = \sqrt{\frac{2R(T_6 - T_5)}{1-\kappa} + \omega_5^2 + 2T_0 \left[C_p \ln\left(\frac{T_5}{T_6}\right) - R \ln\left(\frac{P_5}{P_6}\right) \right] + C_p(T_6 - T_5)}$$

$$c) \Delta e_{\text{ex, str}} = e_{\text{ex, str, } 6} - e_{\text{ex, str, } 0}$$

$$= h_6 - h_0 - T_0(s_6 - s_0) + \frac{1}{2}(\omega_6^2 - \omega_{\text{cuff}}^2)$$

$$= c_p(T_6 - T_0) - T_0 \left[c_p \ln \left(\frac{T_6}{T_0} \right) - R \ln \left(\frac{P_6}{P_0} \right) \right] + \frac{1}{2}(\omega_6^2 - \omega_{\text{cuff}}^2)$$

Designing for the elderly: A review of the literature

John R. Weller, *Department of Industrial and Manufacturing Engineering, University of Wisconsin-Milwaukee, Milwaukee, WI 53201, USA*

Received 12 January 2000; accepted 12 March 2000

Abstract: This paper reviews the literature on design for the elderly. The focus is on the physical and cognitive changes that occur in the elderly and how these changes affect their ability to use products. The paper also discusses the design of products for the elderly.

Keywords: elderly, design, ergonomics, product design

1. Introduction The elderly population is growing rapidly in the United States. In 1990, there were 35 million people aged 65 years or older. By 2010, it is estimated that there will be 50 million people aged 65 years or older (U.S. Bureau of the Census, 1990).

The elderly population is a diverse group. They come from all walks of life and have different backgrounds. Some are retired, some are still working, some are healthy, and some have health problems. The elderly population is also a diverse group in terms of their physical abilities. Some are able to live independently, while others need assistance with daily activities.

Designing for the elderly is a challenge. The elderly population has unique needs that must be addressed. One of the most important needs is the ability to use products. Products must be designed to be easy to use and safe for the elderly.

This paper reviews the literature on design for the elderly. The focus is on the physical and cognitive changes that occur in the elderly and how these changes affect their ability to use products. The paper also discusses the design of products for the elderly.

2. Physical changes in the elderly As people age, they experience physical changes. These changes can affect their ability to use products.

One of the most common physical changes in the elderly is a decrease in strength. This can make it difficult for them to lift heavy objects or hold onto things. Another physical change is a decrease in flexibility. This can make it difficult for them to reach for things or bend over.

A third physical change is a decrease in balance. This can make it difficult for them to walk or stand. A fourth physical change is a decrease in endurance. This can make it difficult for them to do tasks that require a lot of energy.

Physical changes in the elderly can affect their ability to use products. For example, if a person has difficulty lifting something, they may not be able to use a product that requires them to lift it. If a person has difficulty reaching for something, they may not be able to use a product that requires them to reach for it.

Physical changes in the elderly can also affect their safety. For example, if a person has difficulty balancing, they may fall and injure themselves. If a person has difficulty endurance, they may become fatigued and unable to complete a task.

Physical changes in the elderly can be addressed through product design. For example, if a person has difficulty lifting something, a product could be designed to be lighter or easier to lift. If a person has difficulty reaching for something, a product could be designed to be closer to the person's body.

Physical changes in the elderly can also be addressed through training. For example, if a person has difficulty balancing, they could be taught to use assistive devices like canes or walkers. If a person has difficulty endurance, they could be taught to take breaks and rest when needed.

Physical changes in the elderly can also be addressed through medical intervention. For example, if a person has a physical condition that affects their strength, they could be treated with medication or physical therapy.

Physical changes in the elderly can also be addressed through social support. For example, if a person has difficulty using a product, they could be assisted by a family member or friend. If a person has difficulty balancing, they could be assisted by a caregiver.

Physical changes in the elderly can also be addressed through environmental modification. For example, if a person has difficulty reaching for something, they could be assisted by a family member or friend. If a person has difficulty balancing, they could be assisted by a caregiver.

Physical changes in the elderly can also be addressed through product design. For example, if a person has difficulty lifting something, a product could be designed to be lighter or easier to lift. If a person has difficulty reaching for something, a product could be designed to be closer to the person's body.

Physical changes in the elderly can also be addressed through training. For example, if a person has difficulty balancing, they could be taught to use assistive devices like canes or walkers. If a person has difficulty endurance, they could be taught to take breaks and rest when needed.

Physical changes in the elderly can also be addressed through medical intervention. For example, if a person has a physical condition that affects their strength, they could be treated with medication or physical therapy.

Physical changes in the elderly can also be addressed through social support. For example, if a person has difficulty using a product, they could be assisted by a family member or friend. If a person has difficulty balancing, they could be assisted by a caregiver.

Physical changes in the elderly can also be addressed through environmental modification. For example, if a person has difficulty reaching for something, they could be assisted by a family member or friend. If a person has difficulty balancing, they could be assisted by a caregiver.

Physical changes in the elderly can also be addressed through product design. For example, if a person has difficulty lifting something, a product could be designed to be lighter or easier to lift. If a person has difficulty reaching for something, a product could be designed to be closer to the person's body.

Physical changes in the elderly can also be addressed through training. For example, if a person has difficulty balancing, they could be taught to use assistive devices like canes or walkers. If a person has difficulty endurance, they could be taught to take breaks and rest when needed.

Aufgabe 3

$$a) P_{G,1} = P_{amb} + \frac{m_K \cdot g}{A} + \frac{m_{EW} \cdot g}{A} + P_{EW}$$

$$P_{EW} (T_{EW} = 0^\circ C) = 1.4 \text{ bar}$$

~~$$A = \pi \cdot \left(\frac{d}{2}\right)^2 = \pi \cdot \left(\frac{0.1 \text{ m}}{2}\right)^2 = 0.00785 \text{ m}^2$$~~

$$\underline{P_{G,1}} = 1 \text{ bar} + \frac{32 \text{ kg} \cdot 9.18 \text{ m/s}^2}{0.00785 \text{ m}^2} + \frac{0.1 \text{ kg} \cdot 9.81 \text{ m/s}^2}{0.00785 \text{ m}^2} = 1.4 \text{ bar}$$

$$= \underline{\underline{2.8 \text{ bar}}}$$

IG: $P_{G,1} V_{G,1} = m_{G,1} R T_{G,1}$ $R = \frac{R}{Mg} = \frac{8.314 \frac{\text{J}}{\text{mol K}}}{0.05 \frac{\text{kg}}{\text{mol}}} = 166.28 \frac{\text{J}}{\text{kg K}}$

$$m_{G,1} = \frac{P_{G,1} V_{G,1}}{R T_{G,1}}$$

$$= \frac{2.8 \cdot 10^5 \text{ Pa} \cdot 3.14 \cdot 10^{-3} \text{ m}^3}{166.28 \frac{\text{J}}{\text{kg K}} \cdot 273.15 \text{ K}} = 0.006839 \text{ kg}$$

$$= \underline{\underline{6.84 \text{ g}}}$$

b) Es fließt erst keine Wärme mehr, wenn das ganze Eis geschmolzen ist. Dabei bleibt der Druck gleich

→ Temperatur $T_{G,2} \approx$ ist gleich wie die Temperatur des EW's

$$\Rightarrow \underline{\underline{T_{G,2} = 0^\circ C}}$$

Der Druck des ~~gas~~ Gases bleibt gleich $\Rightarrow \underline{\underline{P_{G,2} = 2.8 \text{ bar}}}$

$$c) 1. HS \text{ um das Gas: } \frac{dE}{dt} = \sum_i m_i [\dot{h}_i + \dot{p}_i + \dot{k}_i] + \dot{Q} - \dot{W}$$

$$\Delta U = Q_{12}$$

$$m_{\text{Gas}} (u_2 - u_1) = Q_{12}$$

$$Q_{12} = m_g c_v (T_2 - T_1) \quad (\text{perfekter Gas})$$

$$Q_{12} = 3.6 \cdot 10^3 \text{ kg} \cdot 0.633 \frac{\text{kJ}}{\text{kgK}} (273,15 \text{ K} - 773,15 \text{ K}) \\ = -1.139 \text{ kJ} = -\underline{1139,4 \text{ J}}$$

\Rightarrow Es wurde 1139,4 J übertragen.

$$d) 1. HS \text{ um Eis: } \frac{dE}{dt} = \sum_i m_i [\dot{h}_i + \dot{k}_i + \dot{p}_i] + \dot{Q} - \dot{W}$$

$$\Delta U = Q_{12}$$

$$m_{\text{EW}} (u_2 - u_1) = Q_{12}$$

$$u_2 - u_1 = \frac{Q_{12}}{m_{\text{EW}}} \Rightarrow u_2 = u_1 + \frac{Q_{12}}{m_{\text{EW}}}$$

~~aus~~ =

$$u_1 = u_{\text{fest}} + x_{\text{Eis},1} (u_{\text{flüssig}} - u_{\text{fest}})$$

$$= (-333,485 + 0,6 (-0,045 + 333,485)) \frac{\text{kJ}}{\text{kg}}$$

$$= -133,421 \frac{\text{kJ}}{\text{kg}}$$

$$u_2 = -133,421 \frac{\text{kJ}}{\text{kg}} + \frac{1,5 \text{ kJ}}{0,1 \text{ kg}} = -118,421 \frac{\text{kJ}}{\text{kg}}$$

$$T_{G,2} = T_{\text{EW},2} = 0,003^\circ\text{C}$$

$$x_{\text{Eis},2} = \frac{u_2 - u_{\text{fest}}}{u_{\text{flüssig}} - u_{\text{fest}}} = \frac{-118,421 + 333,442}{-0,033 + 333,442} = \underline{\underline{0,64}}$$

Aufgabe 4

b)

	T [°K]	P [bar]	
1	31.33		adiabate Prozess = isotherm + isenthalp $h_4 = h_1$
2	-22°C 31.33		$x_2 = 1 \rightarrow$ isobar $\Delta h_2 = \dot{Q}_K \rightarrow$
3	31.33	8 bar	$w_K = 28 \text{ W}$ isentrop $\Rightarrow S_2 = S_3$
4	31.33	8 bar	$x_4 = 0$

$$h_1 = h_4 = h_f(8 \text{ bar}) \stackrel{\text{A-11}}{=} 93.42 \frac{\text{kJ}}{\text{kg}}$$

$$S_2 = S_f(8 \text{ bar}) \stackrel{\text{A-11}}{=} 0.9066 \frac{\text{kJ}}{\text{kg K}}$$

$$2 \rightarrow 3: \text{isentrop} : S_2 = S_3 = 0.9066 \frac{\text{kJ}}{\text{kg K}}$$

$$\cancel{x_2 = S_2} \Rightarrow T_3 = T_{\text{sat}}$$

$$1. \text{ HS um Verdichter: } \frac{dE}{dt}^o = \dot{m}_{R134a}^o (h_2 - h_3) + \dot{Q} - \dot{W}_K$$

$$\dot{W}_K = \dot{m}_{R134a}^o (h_2 - h_3)$$

$$\dot{m}_{R134a}^o = \frac{\dot{W}_K}{h_2 - h_3}$$

$$c) \text{ Zustand 1: } p_1 = 31.33 \text{ bar} \quad h_1 = h_4 = h_f(8 \text{ bar}) \stackrel{\text{A-11}}{=} 93.42 \frac{\text{kJ}}{\text{kg}}$$

$$x_1 = \frac{h_1 - h_f}{h_g - h_f}$$

$$d) \quad \dot{\epsilon}_K = \frac{\dot{Q}_{21}}{\dot{w}_k} = \frac{\dot{Q}_K}{\dot{w}_k + \dot{w}_D} = \frac{\dot{m}_{134a}(h_2 - h_1)}{\dot{m}_{134a}(h_4 - h_1) + \dot{w}_D}$$

$$\dot{w}_D = \dot{m}_{134a}(h_4 - h_1)$$

$$\dot{Q}_K = \dot{m}_{134a}(h_2 - h_1)$$

- e) Die Temperatur würde immer weiter abnehmen bis man in den kritischen Bereich kommt.

