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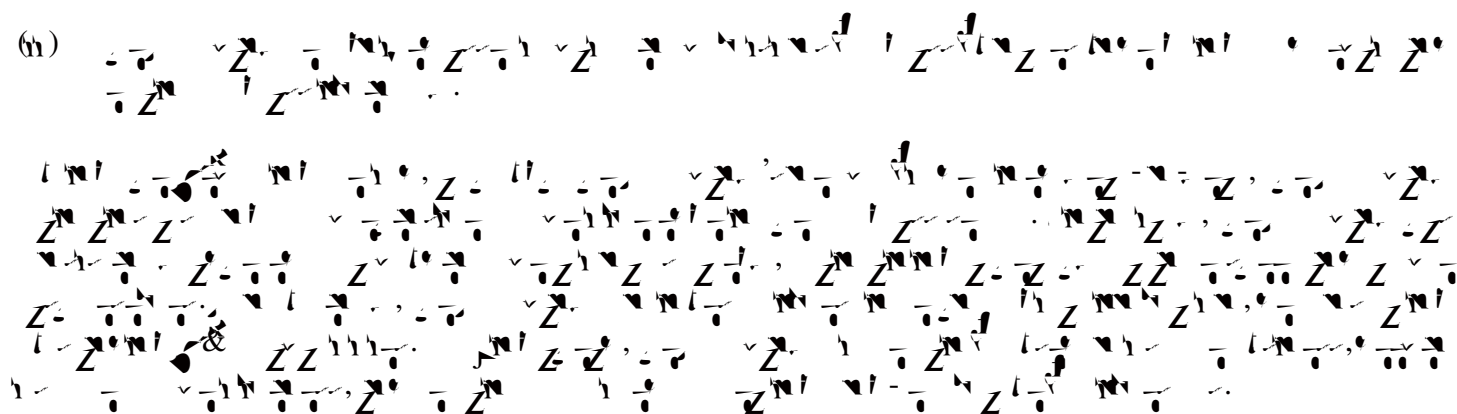
$\mathbb{Z}^n$ 上の $\mathbb{Z}$ -線形写像 $\phi: \mathbb{Z}^n \rightarrow \mathbb{Z}$ を考える。このとき、 ϕ の核 $\ker \phi$ は $\mathbb{Z}^n$ の $\mathbb{Z}$ -線形部分加群であり、 $\mathbb{Z}^n / \ker \phi \cong \text{Im } \phi$ である。ここで、 $\text{Im } \phi$ は $\mathbb{Z}$ の $\mathbb{Z}$ -線形部分加群である。したがって、 $\text{Im } \phi$ は $\mathbb{Z}$ の $\mathbb{Z}$ -線形部分加群であり、 $\mathbb{Z}^n / \ker \phi \cong \text{Im } \phi$ である。

Figure 1 consists of two schematic diagrams, (a) and (b), illustrating the structure of the polymer. Diagram (a) shows a linear chain structure with repeating units of poly(vinylidene fluoride) (PVDF) and poly(vinylidene fluoride-co-trifluoroethylene) (P(VDF-TrFE)). The units are represented by circles containing 'F' and 'H' atoms, with bonds indicating the polymer backbone. Diagram (b) shows a cross-linked network structure, where the polymer chains are interconnected by cross-links, forming a three-dimensional network. The labels 'PVDF' and 'P(VDF-TrFE)' are used to identify the different polymer components.

$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

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(41)

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1. *What is the purpose of this document?*
 2. *What are the main findings of the study?*
 3. *What are the implications of the findings?*
 4. *What are the limitations of the study?*
 5. *What are the conclusions of the study?*
 6. *What are the recommendations of the study?*
 7. *What are the future research directions?*
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